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A CHRISTIAN APOLOGY.

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A

CHRISTIAN APOLOGY

BY

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IN THREE VOLUMES.

VOL. I: GOD AND NATURE.

FIFTH REVISED EDITION.

Frederick Pustet & Co.

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TRANSLATORS' PREFACE.

Every Catholic, even moderately acquainted with the course of modern science, must be painfully aware that its professed relations to faith are simply hostile. Weapons are sought in every region of enquiry and speculation, with which to beat down revealed truth, or to assail its defenders. Geology, Palæontology, Ethnology, Biblical Criticism, and, above all, the new Science of Comparative Religion yield arguments that must be met, and difficulties that must be answered if we would save educated Catholics, perhaps from loss of faith, but certainly from painful perplexity of mind. Questions of faith and science are now in the forefront of our modern intellectual life. They confront us at every turn. To enable our people to cope with them, there is needed a standard work of reference, dealing systematically with scientific questions from a Catholic standpoint. In Germany and France several such works have been published, of which, as regards England, it may be truly said: Græca sunt, non leguntur. It is strange that England, one of the great strongholds of physical science,

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should have been so long left almost wholly unprovided with works of this character. We believe, then, that we shall meet a pressing need in giving to the English-speaking world a translation of Dr. Schanz's *Apologie des Christenthums.*

The name of its author is an ample guarantee that this work is at once Catholic in tone, and fully abreast of the learning of the day. Dr. Schanz is one of the most distinguished savants of Catholic Germany. Schanz, Funk, and Kepler, whose names now shed lustre on the Catholic Faculty of Tübingen, are no unworthy successors of Möhler, Kuhn, and Hefele. The *Apologie*, which has the *Imprimatur* of Bishop Hefele of Rottenburg, has been well received in Germany. Both by reason of its matter and manner of treatment, it is admirably adapted to the needs of English readers. Unlike most manuals of the kind, it does not take the facts for granted; but before propounding solutions and explanations, it presents a clear view of the facts that go to make up the scientific state of the question.

The present volume, as the subsidiary title indicates, discusses the questions raised by the natural sciences. The second volume, which is already in the press, and which, it is hoped, will be ready in April, deals at length with the Comparative Science of Religion, and with the main issues raised by Biblical Criticism. The third volume is an apologetic treatise on the Church. Thus in three volumes

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the Catholic student will have to hand a complete manual, up to date, of the *Demonstratio Christiana* and the *Demonstratio Catholica.*

We have had to battle with exceptional difficulties in the translation ; yet, while allowing ourselves a certain amount of latitude in language, we have scrupulously endeavoured to adhere to the sense of the author. Instead of leaving the summary prefixed to each individual chapter, we have given a consecutive table of contents at the beginning. The notes, which in the original are appended to a chapter *en bloc*, are here inserted as they occur. We had intended, in each case, to give the references to the English editions of works, which the author quotes in German, but, finding in many instances that the German edition was practically a distinct work and not a translation, and that it was hardly possible to indicate the exact corresponding passages in English, the plan had to be abandoned.

The third volume will contain a copious index of the whole work.

St. Mary's, Oscott,
Feast of the Epiphany, 1891.

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CHAPTER I.

APOLOGY AND APOLOGETICS.

The idea of justification and defence is included in the very idea and nature of Religion. Religion must defend and make good its claims before two tribunals: the mind of the believer, and the conscience of society. For, however divergent may be men's notions of religion, however much moral precepts may differ, it is agreed on all hands that they transcend the limits of sensible experience and overstep the bounds of natural knowledge. All men are agreed that there exists a moral law independent of the will of man. The more man is disposed to make his reason the measure of the universe, and his will the standard of action, the more weighty must be the arguments by which he is induced to submit his mind to a higher intelligence, and to bring his will into subjection to a higher power. Not only the temporal well being of individuals and of society, but also man's future destiny depends on a right solution of religious questions. Nevertheless, in communities that cannot boast of a high order of civilization, the inward contentment and peace of soul, that springs from faith and a religious life, is allowed to do duty for external proofs. Hence the bearing of religion on human happiness and misery is treated more as a matter of sentiment than of conscious knowledge. Individuals and society, however, in proportion to the advance they make in natural knowledge

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and morality will grow in the consciousness that religion is of the utmost significance to their welfare. The mind's insatiable thirst for knowledge begets deeper and deeper reflection on the grounds of religious belief. The vast interests at stake make believers anxious to establish harmony between heart and mind, and between science and faith, in order that their obedience may seem reasonable both to themselves and to others. But individuals are likewise members of society; man is a social being. Now religion has mightily swayed the thoughts and actions of families, tribes, and states, nay, of the whole human race. On this point the verdict of experience and history is unanimous. The movements that have most powerfully influenced the life of nations have ever been religious. In all undertakings, fraught with consequences, subjects and rulers have regarded an appeal to religion and to the will of the Gods as decisive. All that charms the eye and delights the ear in poetry and art, or that gratifies the mind's cravings in science,—all has its root in religion, and derives its force and strength from religious enthusiasm. A decadence in religion is accompanied by a corresponding decadence in art and science. History and ethnography make it quite clear that the decay of religious systems is owing to the action of many (often contradictory) causes; *e. g.* peculiarities of race, historical development, climate, and so on. Comparative philology and the comparative science of religion have now in part lifted the veil that had hitherto hidden the beginnings of religious life among the civilized peoples of ancient times. But it has thereby given birth to the necessity of instituting a comparison between the various religious systems, and of likewise defending the faith that is in us.

Etymologically, religion signifies a bond of union between man and God. Its aim and object is to lead man to God, and to unite him to God for ever. But this implies that some prior union originally existed. All known religions trace their origin to a divine revelation. Religion came down from above in order to set man free from the trammels of this lower

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world of sense; hence it is arrayed in hostility to this world and its ruler, and to man's lower earthly nature. It stirs up strife in the heart of man, in the family, and in society. It is therefore, all the more incumbent on religion to justify itself in the eyes of the natural man and of a sinful world, by making good its claim to be the legitimate daughter of heaven. The proof advanced in behalf of revealed religion must be so overwhelming as to compel mind and heart to yield a willing assent. Supernatural religion is essentially one and infallible. It lays the same yoke on all without exception or distinction. It is also universal in time. Time and circumstances may bring change of form; but the truth itself is ever the same. Supernatural religion is not merely one true religion among many, but it alone is true. Compared with it all other religions are, in a greater or less degree, false. They are true only in so far as they are conformable to it: the truth they contain is a borrowed truth. The reasons urged in support of the claims of supernatural religion must be commensurate with the high authority to which it appeals, and with the weight of obligation it imposes on men. In particular, all these points have to be proved in the case of Christianity,—the last and most complete revelation of God which, as enshrined in a new divine institution, has renewed the face of the earth.

The facts of history bear out the antecedent speculations of theory. It can easily be shewn from the history of religion that founders of religions always lay claim to a divine illumination, and that their adherents insist on its truth being attested by miracles. Here, however, it is enough to refer to the known history of revelation.

When God appeared to Moses he chose a flame of fire in a bush. Moses saw that the bush was burning but not consumed*; and thus he was prepared to accept the revelation as such. He himself was convinced of its truth. But how could he expect the people to believe in it? They will not believe me,

* Exodus iii. 2.

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he said to the Lord, nor hearken to my voice, but they will say: the Lord hath not appeared to thee.* And the Lord gave Moses a triple sign: the rod changed into a serpent, the leprous hand, and the water converted into blood, "that they may believe that the Lord God of their fathers, the God of Abraham, the God of Isaac, and the God of Jacob hath appeared to thee." It was the same with the prophets. Like Moses they too were penetrated with a sense of God's presence and of the truth of revelation; but they had to give the people evidence of their mission. In the New Law the revelation is made by Jesus Christ himself, the Son of God made man. Whereas God, at sundry times and in divers manners spoke, in times past to the fathers by the prophets, in these days He hath spoken to us by His Son.† Even Jesus did not come without His credentials. The entire Old Testament singled him out as the promised Messias; miracles attended His conception and birth; at His baptism in the Jordan He was solemnly consecrated to His office of Messias. Nor did Jesus fail to produce evidence in word and work, that He was truly the Son of God and the long-expected Messias. He appeared before the people as one having power, and He deigned to show His power by working miracles. If the Jews would not believe His words, at least they should believe His works. Jesus endued His disciples also with power from on high in order that they might convince the astonished heathen world that the truth which they preached came from heaven, and that shadows and darkness must therefore vanish. And they going forth preached everywhere; the Lord working withal, and confirming the word with signs that followed.‡

If the organs of supernatural revelation needed a special proof of the truth of their mission and doctrine in order to encounter successfully the antagonism of the world, revealed religion itself must both need and be capable of proof. In both the Old and New Testaments the apologetic

* Ibid. iv. 1. † Hebrews i. 1. ‡ Mark xvi. 20.

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element predominates to a remarkable extent. It is generally admitted that Holy Scripture subordinates profane things and profane sciences to religious ends. It is equally well known, if not so universally allowed, that this religious end is, as a rule, closely connected with apologetics. The very first chapter of Genesis can only be rightly understood by contrasting it with the polytheism and nature-worship that everywhere prevailed. The most prominent feature of the Old Testament—belief in the one true God—ever calls to mind the false gods of the heathen. Adore no strange god—have no other god but me, was God's command; and Israel's observance or transgression of this commandment had an important bearing on its history. Fidelity to God brought prosperity, but adversity followed in the wake of infidelity. Hence the Old Testament is a grand apology for divine revelation against heathen idolatry. And, as is well known, this apologetic tendency is very strongly marked in the New Testament. In the majority of his Epistles S. Paul has to defend either his office, or his person, or his gospel, or the truth of Christianity against every species of attack. In himself he experienced how a believer must be ready to give himself and others an account of the substance and grounds of his faith. Hence he requires the priest to embrace "that faithful word which is according to doctrine, that he may be able to exhort in sound doctrine, and to convince the gainsayers."* Wherefore S. Peter does not merely strive to comfort the sorrowing faithful by referring to the Christian's hope, but he declares it to be likewise the duty of the believer to be on the alert, and always ready to satisfy every one that asketh a reason of that hope which is in him.† The prologue to S. Luke's gospel and the conclusion of S. John's betray an apologetic purpose, which, however, is less perceptible in the body of those gospels.

But, it may be argued, is not *faith* a necessary postulate of religion? Is not natural reason incompetent to prove the truth

* Titus i. 9. † I. Peter iii. 15.

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of supernatural revelation? Must, then, the defence, which is acknowledged to be necessary, be set down as impossible or illusory? So it would really seem. For this reason some writers reject external and metaphysical proofs as of no avail in matters of faith. Pascal declares he will not attempt to prove either the existence of God, or the Trinity, or the immortality of the soul, or any other such truth from reason; and he refuses, not merely because he feels unequal to the task of finding any argument in nature forcible enough to convince an atheist, but also because such knowledge without Jesus Christ is barren and unprofitable. What doth it profit a man unto salvation to know that mathematical axioms are immaterial eternal truths, subsisting in dependence on the first truth?[1] Protestant schools of theology are also very sceptical about metaphysical proofs. Positivists and Rationalists take a different route but reach the same goal. But no such stumbling-block besets the path of the sound apologist. He is fully aware that the metaphysical Absolute and the God of religion are not the same, and that their effect on the heart is very different. He knows full well that a religious idea of God, even in its most general form, is unattainable by metaphysics. But deeply conscious of the rights of the human heart, he cannot afford to ignore metaphysical proofs. They are defective, it is true; but all human knowledge, especially religious knowledge, is necessarily imperfect.

The idea of God, S. Augustine has said, is more truly conceived than expressed; and God is truer than He is conceived. Even the advanced knowledge of God obtained from revelation is no exception. Maybe S. Thomas and many of the Schoolmen set too high a value on these proofs; but they did not thereby dispense with faith. Religious life, in its essence, depends on that exercise of the will which calls forth the Act of Faith. For this reason Albertus Magnus, Alexander Hales, S.

[1] Pascal. *Pensées sur la religion et sur quelques autres sujets.* Amsterdam, 1758. Preface and 2, 20, 1, 2.

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Bonaventure, and many others, taught that even those things which are naturally evident can still be the material object of faith. Faith and knowledge may coexist with regard to one and the same object. For, however well a thing is known, there are in its nature unexplored and unknown depths. Apologetic proofs are but the preliminaries of faith. Faith begins where apology ends. In natural science, what is known cannot be believed, Not so, however, in the realm of the supernatural, where man never knows more than a shadow, and a bare outline of the whole truth. Faith alone opens the understanding to the light of the truth; faith alone brings full conviction.

But, it will be asked, can the claims of faith clash with the claims of apology? A collision is possible on one supposition only: if reason were required to supply a formal proof of revelation, and if the fact of revelation and its bearings on man's salvation depended on the success of the proof. This, however, does not lie in the province of an apology, but is the work of a constructive philosophy of religion. A defence presupposes the existence of the object to be defended. The bounden duty of the apologist is twofold: to refute objections, and to show that religion is attuned to the chords of man's mind and the beatings of his heart. Revelation was not given to put natural knowledge out of court, or to turn it topsy-turvy.

On the contrary, revelation, taking natural knowledge for granted, enlists it in its service. As a philosophy of life, Christianity is without a parallel. For not only are its doctrines in harmony with reason; but it affords comfort and consolation to sorrow-stricken souls by solving in an intelligible and coherent fashion questions which have at all times stirred the human mind to its depths, and made the human heart surge like a swollen sea; and it is so sublime precisely because it offers, on revealed grounds, an infallible solution of those fundamental problems in regard to which natural philosophers can offer nothing better than hints and conjectures. As a

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philosophy of life it rests upon natural knowledge; but, as *the one* infallible philosophy, it is built on the immovable rock of God's word. Only He, who is absolute truth and sanctity itself can supply that ultimate principle of certitude which places virtue and beatitude on a sure footing. When the Apostle, in the Epistle of the Corinthians,* says that the Lord did not send him to preach in wisdom of speech lest the Cross of Christ should be made void, and that therefore he preached Christ Crucified, unto the Jews indeed a stumbling-block and unto the Gentiles foolishness, he drew a bold and, perhaps, rather rough sketch of the sharp triangular duel between the Gospel, Jewish Faith, and heathen wisdom. But in these words he did but give expression to a thought underlying revelation, that the kingdom of God is not of this world, and that the poor have the Gospel preached to them. He declares war to the knife not against true wisdom, but against the science that puffeth up, that inflates the creature with pride, and makes him turn his back on his Creator. Taking as his starting-point the Gospel, as the power to every one that believes, he proceeds to show how Christianity alone is competent to give a thoroughly satisfactory solution of the momentous problems of life. He grinds the theories of idolatry to powder; he exposes the threadbare nature of Jewish hopes; from psychology and experience he demonstrates with touching and telling force man's need of grace and redemption. Yet,in spite of his adamantine faith,in spite of his full persuasion that faith in Jesus is the gate of salvation, he in nowise shuts his eyes to the conditions of heart and mind that must necessarily precede this faith. He demands a *reasonable* obedience.[2] He adduces facts from our Lord's life to prove the truth of the promises made to Christians. While, therefore, we affirm with the Fathers that it is natural to seek proofs from reason[3] for our belief in Christianity, we re-echo the confession of the same Fathers that we must give an account of the faith

* I Corinthians, i, 17, 23.
2 Romans xii. 1.—Vatican Council 3. 3.
3 Möhler *Patrologie* (Reithmayr's Edition) Regensburg 1840 p. 463.

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that is in us. Revelation and reason, faith and science are not mutually exclusive but inclusive. In origin and end they are, broadly speaking, comparable, although they move in different orbits. And, in order to make the obedience of faith harmonize with the rights of reason, God has vouchsafed outward proofs in addition to the inward promptings of the Holy Spirit. He has set up before the gaze of men certain divine facts, chiefly miracles and prophecies, which clearly show forth His almighty power and infinite wisdom, and are therefore absolutely safe tests of revelation, which all can appreciate.[4] The revelation of God in Creation and Redemption is clear enough to be seen and believed by all who seek God ; but it is also obscure enough to leave room for doubt to men who are not of good-will.[5]

Apology is the name given to a vindication of the faith. Besides warding off attack and making false accusation to blush,* it likewise renders an account of thought and action,† and supplies formal or actual proofs " in the defence and confirmation of the Gospel."‡ The life and death of the Apostles, their writings and their preaching were an apology for Christianity as a whole, and for the several truths and practices that go to make it up. Thus, in the Epistle to the Corinthians,§ S. Paul proves the resurrection of the dead from the fact that Jesus rose again ; from the death and resurrection of Jesus he deduces the importance of baptism ; the works of Jesus establish the certainty of faith. The prophecies of the Old Testament are frequently invoked by the Apostles‖ in proof that Jesus is the Messias and God. The early Fathers wrote apologies to stop the mouth of the heathen and the Jew. Such apologies were simple or elaborate, deep or diffuse, treated of the *prolegomena* or explained the truths of faith, according

4 Mark xvi. 20 ; II. Pet. i. 19 ; Vatican Council 3. 3.
5 Pascal 2. 18. 2.
* I. Cor. ix. 3 ; Acts xxii. 1 ; xxv. 16 ; I. Tim. iv. 16.
† I. Peter iii. 15.
‡ Philip. 1. 7. 16.
§ I. Cor. xv.
‖ See Acts of the Apostles.

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to circumstances. As a rule, however, they did not look beyond the needs of the hour, and handled no more points than were necessary for dealing with the case in hand. They formally differ from scientific expositions of the faith, by being more general in character, and by being written in an easy style and in popular language. Out of the several treatises in which the main truths of Christian doctrine have been successively treated in apologetic fashion, has been built up the science of Christian apology.

But, when particular truths recede into the background and Christianity is viewed generally and as a whole, apology is gradually swallowed up in apologetics. (ἀπολογητική sc. τέχνη). Only in late years has this been recognized to be a systematic branch of theology. Its purpose is to lay out the ground, and to devise the best methods for defending Christianity. But it is not blank methodology any more than dogmatic theology is, or ethics, or æsthetics, or the science of cognition, but it has a scope of its own, positive and defensive. As dogmatic theology is the science of dogma, so apologetics is the science of apology, the scientific vindication of divine truth, and of the rule of life that has been given for all ages and all nations. Its intrinsic connection with dogma has obtained for it the name of general dogmatic theology, because it examines the general grounds on which all dogmas rest. It also goes by the name of fundamental theology, because it investigates the character common to all the truths of faith. It forms no part of its plan to prove that the several doctrines are true; its task is to demonstrate the origin and groundwork of Christianity and to establish its claim to sole authority. Thus Christianity is its own proof; but this alone is not enough. When apologetics is enlisted in the service of any particular Church or Communion, the further duty devolves on it of demonstrating that the doctrines and practices of this particular Church are in accord with revelation. So Catholic Apologetics may be defined as that branch of ecclesiastical science which shows that the Catholic Church is

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the true Church founded by Christ, and guided and quickened by the Holy Spirit; and furthermore, that the truths revealed by Christ and preached by the Apostles have been preserved in the Catholic Church intact and free from adulteration. Thus the *demonstratio Christiana* and the *demonstratio Catholica* go hand in hand.

In this way the boundary-line between apology and apologetics is clearly defined. But their respective provinces may be mapped out still more exactly. The one, as it were, breaks up the ground for faith by preparing the soul; the other strengthens faith and makes conviction doubly sure. Or, to adopt the terminology of the ancients, the former comprises the *præambula fidei*, the latter the *motiva credibilitatis*. Apart from the general drift of the science as a whole, the object of the first part may be described as positive, while that of the second is defensive. Faith presupposes reason; no commandments can be imposed on a being devoid of free-will; revelation is a superstructure built on creation. Man comes into this world with certain endowments, His only way of gaining heaven is to train his soul to seek the things that are above, and make it obedient to the voice of God, and, on the other hand, to look upon the visible world as the image of a world, spiritual and invisible. Now, it is the duty of the intelligent Christian to show that the preliminary conditions of religion and revelation exist in his own nature and in the world around him. But while apologetics confines its operations to the groundwork of faith, apology, without snapping any links in the logical chain of thought, makes certain questions the subject of special and detailed enquiry; to wit, the natural knowledge of God, man's future destiny, the immortality of the soul, and the doctrine of creation. Natural revelation is a necessary stepping-stone to supernatural revelation; the ladder of reason is required to scale the walls of faith. For atheists and materialists, naturalists, pantheists and deists, for those, in fine, who reject all revelation, faith in Christian revelation is

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of course out of the question. Hence the first and foremost business in both apology and apologetics is to show this denial of all revelation to be against reason, and to prove that the existence of God is the necessary outcome of a reasonable view of the world.

And now we are brought face to face with the second function proper to Apology and Apologetics. If supernatural revelation really solves the problems of existence and satisfies the heart's longing for peace, then man has ready to hand a most powerful inducement to believe in revelation, even before he has submitted its details to the searching eye of criticism. This is the inner demonstration, but there is also a corresponding outer one. Supernatural revelation, being an outward act of God, is equipped with external proofs of its credibility. A bare enumeration and a simple historical explanation of these proofs would suffice, had not they, more than all others, been subjected to the dissolving and corrosive tests of criticism. In revelation the divine authority has made use of human organs, and accommodated itself to man's capacity. Revelation has not been communicated to each individual; from many, it is far removed in time and place. Thus a wide range is opened out for the defence. Now the duty of the Apologist is to prove that the Christian revelation is the only true revelation, and that Christianity, in its present form, is clad with the spotless robe of truth, The teaching of Scripture and Tradition regarding the life and character of Jesus, regarding His work and its continuance in the Church show, at a glance, the comprehensive scope of the enquiry.

Thus the contents of historical religion fix the limits of Apologetics proper. Its sphere of work is bounded by existing religions. Unlike the philosophy of religion, which it takes for granted, it does not start from a blank nothing. The apologist tests all in order to keep the best. But his investigations are not blind, or baseless, or prompted by sheer curiosity, rather they move on well-defined lines which are

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regulated by the lines on which the attack on the Christian position proceeds. Hence the apologist and the theologian work on different sets of principles. The apologist's method of demonstration is based on the natural knowledge supplied by reason and the experimental sciences. Apologetics cannot coerce faith, or borrow proofs from faith. True, it leaves the preliminary questions of first principles to philosophy; but its starting-point must be the general results of the philosophy of religion, since these cannot be obtained without reference to historical development and the religious sense of mankind. Natural and philosophic knowledge must combine with religious knowledge, and the religious sense of mankind; internal experience must be set side by side with the true philosophical view of the world, and the historical knowledge of external revelation. Doubtless, in recommending the spirit and power of Protestants as the best and surest proof, Lessing was cynical; but anyhow he correctly discerned one essential element in Apologetics. Mere abstractions and the formal processes of the mind are admittedly no adequate guarantee for the reality of ideas. Christian revelation, which forms the keystone of Apologetics, should be regarded in two lights; firstly and chiefly, as a work of redemption, freeing man from the bondage of error and sin; and secondly, as a manifestation of the Spirit of God, taking possession of man's heart and mind. It should not, however, be forgotten that apologetics is intended for others besides those who have experienced or are experiencing the power of the Gospel. The mind is subject to more stringent laws than feeling and fancy, these latter being open to many influences from within and without which place the certitude of the mind in great jeopardy. Were all external proofs set aside, and faith made to rest solely on internal and immanent reasons, it would be impossible to discover a general basis for belief and practice. Belief in the objects of faith is no more dependent on subjective grounds than is the belief in the external facts that are inseparably bound up with revelation.

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As the rationalist, who makes reason the measure of revelation, reduces revealed truth to a minimum, so the believer, who throws cold water on the apologetic proof for an external revelation, robs revelation of its guarantees. True, we can only feel and experience, we cannot prove the value of the blessings that Christianity has brought in its train ; still these benefits must be as capable of being externally recognized as the Christian religion itself. He knows the will of God best who does it ; but he who promulgates it must, to say the least, be able to offer some external security.[5] For this reason the Vatican Council[6] condemns those who teach that no external signs can make divine revelation credible, and that each one's internal experience or private inspiration is the only guide to faith. Anyhow, it is necessary to attend alike to the requirements of both. As sensation and feeling precede concept and judgment, so religion melts the heart before it thaws the understanding. The knowledge of God is not the parent but the child of religion. The will reigns supreme from end to end of the spiritual life ; in religious questions especially, its word is law. It may be better, therefore, in practice to enlist the sympathies of the heart before trying to captivate the understanding. As a rule it is easier to prick the conscience than to conquer prejudice. The proofs for God's existence, drawn from nature, are unnecessary for those who see God everywhere in nature ; and, on the other hand, they make but little impression upon the minds of men who view nature in a different light. Although nature is ever dinning this truth into their ears, they are deaf to her voice.[7] Nevertheless the method of science must differ from that of the Catechism and the Homily. If the Catechism says : 'Thou Shalt,' science must give the reason why. The Christian idea of God, and the idea of God derived from nature are as wide apart as the poles. The God of the Christian is a God of love, a comforter ;

5 John vii. 17, 18.
6 Vatican iii. 3 can. 3.
7 Pascal 2, 10, 1, 2.

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He fills the heart and souls of them that possess Him ; He makes man feel his wretchedness and misery, but He is also infinite in mercy and breathes into man's soul humility, joy, confidence and love. But, alas ! how many struggles within and without has the soul to undergo before reaching that blissful haven of religious peace ! How often is the soul tossed to and fro on a restless sea, between fear and hope, faith and doubt !

The insufficiency of the anthropo-psychological method becomes still more strikingly apparent when we come to consider the hostile attitude that modern science has adopted towards religion. The heathen Celsus ridiculed Christian doctrines as unreasonable ; modern science attempts to solve all the great problems of life and existence independently of Christianity. Empirical science has gained the ascendant over mental science and philosophy. The more the mind pins its faith to external experience and the exact sciences, the more necessary it becomes for the Apologist to draw the lines of demarcation between natural and religious knowledge. The change of front executed by natural science in these latter days has rendered this method necessary. Positivists and Nihilists call existing methods in question, and recognize as valid only those arguments which are drawn from reason. Appeals to authority are, in their judgment, insane. Hence the Apologist is bound to show, from the nature of things and from the nature of man, what are the preliminary steps to be taken, and what conditions are required before faith can exist. In a word, the Apologist must follow modern science step by step. Questions not dreamed of in the philosophy of bygone ages have arisen, demanding new methods of treatment. The Fathers first showed the absurdity of idolatry, and then, by a natural transition, led men from the worship of created things to worship the Creator. Then they proceeded to show from the gospels, and from the testimony of the prophets and apostles that the promised Redeemer had come.[8]

8 Orgenes *c. Celsum*, iii, 15.

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At the outset the modern apologist is confronted by two colossal errors. He finds that science has deified nature, and turned mind into matter. He must, therefore, slay this hydra-headed monster before he can safely begin to build the citadel of positive religious truth. In a certain sense the task of the apologist may be said to be substantially the same as it ever was. Like the Gnostics and the philosophers of old, modern naturalism inveighs against the doctrine of creation. In impugning prophecies and miracles modern rationalists are but aping ancient sceptics. In making war on the authenticity of Holy Scripture, modern biblical critics are marching under the banner unfurled long ago by Celsus, Porphyry, and Hierocles. In despising Christian life the modern Epicurean is as rancorous as the old. And yet it is sufficient to mention the physical sciences, and the comparative sciences of religion and language to see what an impassable gulf separates the ancient from the modern method. On the wise man, according to S. Thomas, devolves the double duty of demonstrating truth and refuting error. But, inasmuch as the several errors are not always clearly set forth, and as, moreover, opponents do not allow any authority to Holy Scripture, the only available weapons are general arguments from reason. As faith rests on the authority of God revealing Himself, a knowledge of Him who bears witness to it must precede faith. But the authority of God will be decisive only for those who already know God and His attributes. Here, it is quite immaterial whether He be considered merely as a necessary condition or an efficient cause. At any rate Apology, setting out from the universal truths of reason, arrives at the particular truths of religion; and from the general requirements of the moral law it advances to the particular precepts of Christian morality.

We need not enquire where the line is to be drawn between Apology and Apologetics, as we are not concerned with scientific apologetics. Scientific apology and apologetics have the same internal systematic connexion, though, externally, the

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connexion is hardly perceptible. Apology takes its stand on the fact of religion. This is the point from which it starts to try and explain, negatively and positively, the origin of religion. The idea of religion, when analysed, resolves itself into three elements: The belief in a Supreme Being, the immortality of the soul, and future retribution. These truths, however, are unintelligible, unless the world is the work of a Creator, whose omnipotence and godhead are manifested therein. Our study of natural revelation will close with a comparison between the biblical account of Creation and the discoveries of science. This will serve as an appropriate transition to supernatural revelation which, of course, centres in the Christian religion and life. In the Holy Scriptures, especially in the life of our Lord, there is abundant food for study, and much to be defended because much has been vigorously assailed. Nowadays this is justly considered the most important part of an Apology. The validity of the Christian religion cannot be impeached by other religions, even should it appear that their stock of truths is larger than has been heretofore supposed. The light of Christianity alone enables us to understand and appreciate their significance. The third part of our Apology will treat of the institution and endowment, the government and office of the Church. Here apology and dogma are less easily distinguished, as the two sciences cross each other's border. But this part of the subject makes it quite clear that apologetics is not a mere philosophical treatise. Apology, however, is not merely the handmaid of Dogma or Ethics, since it has its own distinct province; it should rather be described as the introduction to, and foundation of both.[9]

9. For the literature on this point see Kuhn, *Einleitung in Kath. Dogmatik.* 2d Ed. Tübingen 1859 p. 201 seq.; Kleutgen, *Theologie der Vorzeit* 3 vols. Münster 1860. p. 304 seq.; Steude, *Beiträge Zur Apologetik*, Gotha 1884.—F. Duihlé de St.-Projet, *Les conditions nouvelles de l'apologétique et de l'exegèse à l'heure présente* (*La Controverse* 1884 Nr. 68.) *Apologie Scientifique de la Foi Chrétienne*, Paris 1885.

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CHAPTER II.

HISTORY OF APOLOGETICS.

History, we are often told, is a sure and safe guide. As an aid, therefore, to the clear understanding of the scope and method of Apology, it will be profitable to trace the history of Apologetic Science. The further the canonical books of ancient civilized peoples are removed from the source of religion, the more they are occupied in refuting objections and contrary opinions. Greeks and Romans defended religion against scepticism and unbelief. After mythology, in its literal acceptation, had become the butt of scorn and ridicule, an attempt was made to prop it up with allegories and moral interpretations in order to make it available for daily life.[1] The Jews, assuredly, were not wanting in zeal in the defence of their religion, as the Old Testament, from the first page to the last, abundantly testifies. When, at a later period, they were unable to arrest the advance of Greek literature, they tried to paralyze its influence by maintaining that the Greeks had borrowed their wisdom from the Old Testament. But as the form often sounded harsh to the ear of the cultured Greek philosopher, they sought to attune it to the refined taste of the age. The Greek translation of the Septuagint may be considered a step in this direction. For, in this somewhat free rendering of the original text, the influence of the religious philosophy of Alexandria is clearly discernible. But to the learning and steady determina-

1 Max Müller, *Essays*, 2 vols. *Beiträge zur vergleichenden Mythologie und Ethnologie.* Leipzig, 1881, p. 1 seq.

tion of Philo, the most prominent representative of the Alexandrine School of Jewish Philosophy, chiefly belongs the credit of effecting a reconciliation between religious belief and the philosophic spirit of the age. Although he involved in obscurity the simple idea of creation set forth in the Old Testament, and frequently minimized the contents of the Sacred Books, and sacrificed the substance to the form, he nevertheless gave an impetus to Old Testament exegesis that endured for centuries. In Palestine, the home of Judaism, the orthodox Jews set on foot a similar movement, but on a smaller scale. They paraphrased books of the Old Testament with a view to softening down expressions that seemed objectionable. Anthropomorphism was contracted within the narrowest possible limits. The Schools at Jamnia, Tiberias, and Babylon were still more revolutionary; but instead of making Scripture more intelligible, they encompassed it with a dense forest of jungle, through which only a few privileged scholars can cut their way. Subsequently, in the minds of Jewish theologians, the Talmud took the place of Holy Scripture. Even its advocates, and such as are disposed to see much good in it, must allow that it deviates from the theology of the prophets, and goes astray in religion and morality. As all these Schools were most hostile to Christianity, the Christian Apologist has little to gain from their works; but the biblical student will need to consult them from time to time.

We may therefore fix the limits of our historical enquiry. Apologetics is hardly to be met with, in the early ages, as a distinct science; and yet a tendency to Apology may be traced in the writings of the early Fathers. This was in the nature of things. A religion that was destined to develop from a grain of mustard seed into a big tree, and that aimed at nothing short of the spiritual conquest of the world, was sure to come in conflict with powers both material and spiritual. This gives the clue to the chief divisions of Apologetic History, which, in the main, coincide with the periods of Church

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History. Most authors, following Drey,[1] divide Apologetic history into six periods. The first two fall in ancient times, and are remarkable for their philosophic and historical method. The third period is formed by the Middle Ages, which had to defend Christianity against Islam and Judaism; the fourth includes the struggles against Humanism and Naturalism; the fifth withstood the assaults of Deism in the eighteenth century; the sixth and last period exhibits the Church's defences against the Rationalism, Materialism, and Naturalism of the nineteenth century. But this division is correct only if we abstract from the *demonstratio catholica*, and treat the question purely philosophically.

In subject-matter Apologetics is a positive science, essentially bound up with the destinies of Christianity and the Church. For this reason the two decisive turning-points in the history of the Church should be fixed firmly in the mind: Constantine's recognition of Christianity as the State religion, represented by the Council of Nicæa (325); and the revolt from the Church in the Sixteenth Century, represented by the Council of Trent (1545–1563). In both periods, the apologist is chiefly occupied with the disputes raging between the various Christian sects. This division is generally allowed. Till the reign of Constantine non-christian powers had persecuted the Church; from Constantine to the Reformation the Church was supreme in the sphere of religion. With the Reformation the strifes between Christians began anew. For this was an attack not merely on the outer defences of the Church, as in the struggle between East and West, but on the inner citadel and the very foundations of Christianity. Opposition to public authority in religious matters must in the end lead to the subversion of the supreme authority. Hence it came to pass that revealed truth had now to be defended against the attacks of Christians; whereas, in former times, Jews and pagans had been the chief assailants of

1 *Die Apologetik als wissenschaftliche Nachweisung der Göttlichkeit des Christenthums in seiner Erscheinung*. Vol. i. p. 26. 2nd Edit., Mainz, 1864.

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Christianity. Still it is impossible to determine the limits of the two periods exactly, because the first effects of great changes must be regarded as the reverberation of causes previously at work. This is especially true of the first period, in which Christianity began to spread; but a long time elapsed before the masses were christianized. It will be most convenient to close this period with S. Augustine.

The foes of Christianity in the first period were Jews and heathens. To the latter belong in part the Gnostics and Manichæans, who, under the influence of Eastern religions, utilized stray Christian ideas to build up their systems, while sapping the foundations of Christianity: God's almighty power and goodness, universal redemption and the freedom of man. They went forth from us, says Justin, but they are not of us.[3] The New Testament gives a clear insight into the blind and obstinate character of the Jews. Our Lord, the twelve Apostles, and S. Paul suffered persecution at the hands of the chosen people. And the same fate awaited their disciples after them. It could hardly be otherwise. The blood of the Crucified which, in an evil hour, the infatuated multitude had invoked on themselves and their children weighed so heavily on the consciences of the people that only one of two courses lay open to them: either to be converted, or to persecute the new sect unto death. The Jews chose the latter alternative. They strove to stamp out the Galileans not only by brute force, but also by lying and calumny. S. Matthew's gospel can hardly be described as an apology for Christians against the statements officially made by the Jews, yet on one point it reveals their method of warfare. The Pharisees had bribed the soldiers to say that the disciples had stolen the body of Jesus: "and this word was spread abroad among the Jews even to this day."[*]

The position that Christians had taken up in regard to circumcision and the ceremonial law was favourable to Jewish

3 See Justin Dialog. c. Tryphon. c. 35.
* Matt. xxviii. 15.)

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attacks based on the Law. This may be seen in the Epistle to the Hebrews, and still more clearly, in the Epistle of Barnabas. Notwithstanding the subtle reasonings of the Alexandrine School, an attempt to justify the abrogation of the ceremonial law by allegorical interpretation can only be explained on the supposition, that the Jews tried to frighten the Jewish converts to Christianity, by taunting them with being idolaters and apostates. Justin[4] gives clear evidence of this Jewish device. He asserts that the Jews sent emissaries for the express purpose of creating a prejudice against the preaching of Christ Crucified, and of representing Christian doctrine as a compound of lawlessness and godlessness. This statement is supported by Tertullian, and confirmed by Eusebius, who declares, on the authority of ancient writers, that the Jews sent a circular note to every village in Palestine, decrying Christianity as a new godless heresy, and warning people against the preaching of the Apostles. This would account for the frequent discussions between Jews and Christians, although, be it remembered, Jews were forbidden to dispute with Christians; and it likewise supplies a reason why the oldest apologies were written in the form of dialogues.

The earliest apology of the kind, as far as we know, is the dialogue between a Jewish Christian, Jason, and an Alexandrine Jew, Papiscus. Its date is about the year 140,[5] but it is no longer extant. Justin's dialogue with the Jew Trypho, written about the year 150, is the best known. Justin maintains, in the first place, that the ceremonial law was given to the Jews merely on account of their hardness of heart. Next, he ascribes to the Old Law a purely typical character; and then he goes on to prove that the lowly son of man, who is also the

4 L. c. c. 17, 108, 117. Tertull. *Ad. Nat.* 1, 1, 14; *Adv. Marc.* 3, 23; *Adv. Jud.* 13; Euseb. *in Is.* 18, 1.

5 See Hilgenfeld. *Zeitschrift für wissenschaftliche Theologie*, 1883, 1. Against: Harnach, *Die Ueberlieferung der griechischen Apologeten des 2. Jahrhunderts in der alten Kirche und im Mittelalter*, 1882. According to Maximus, Aristo of Pella was the author. Hilgenfeld identifies him with the Aristion of the *Fragmentum Papiæ*.

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Son of God, born of a Virgin, is the Messias, because the prophecies and types were fulfilled in his person. With his coming, the ceremonial law, prophecy and royalty came to an end. The Jews had made their salvation a mockery, and lost their privileges. Now, Christians are the true people of God, and of the Word who had appeared in the Old Testament. This detailed apology of Justin is followed by that of Tertullian. We gather from the introduction that it, too, originated in a dispute between a Jew (Jason?) and a Christian. S. Cyprian[6] likewise proves Jesus to be the Messias from the Old Testament, but less felicitously. Lactantius (d. 330) also had in view an apology against the Jews. Were we to enumerate in this place all the writings that casually combat Judaism, it would be necessary to continue the history at much greater length, for there is scarcely a writer of note in the fourth and fifth centuries who does not take up arms against Judaism.[7] The history of exegesis and of the canon of the Old Testament, shows what demands Jewish controversy made on Christian science.

The more Christianity freed itself from the trammels of Judaism, and made overtures to the Gentiles, the more urgent became the duty of the apologist to plead its justification before the tribunal of right reason, and conscience. Christianity claimed to be that sovereign truth for which men were everywhere seeking, and it offered the most ample security for the justice of its claim. It purported to be a philosophy that gave a satisfactory answer to all the problems of life and death that perplexed earnest philosophers; but it came as a heaven-born philosophy, bringing its credentials from above. In the long run no philosophy could hold out against such an overwhelming argument. It was this very argument that was ever giving new strength to the utterances of Christian

6 *Testimoniorum libri tres adv. Jud.* ii, 3.

7 Hippolytus, *Demonstratio adv. Judaeos.* Athanasius, *Oratio de Incarnatione.* Gregory Nyssa, *Oratio catechetica magna.* Epiphanius, *Ancoratus.* Chrysostom. *Homiliae viii. adv. Jud.* Cyril Alexand., *Hom. pasch*, 1, 4, 8, 10, 20, 21, 29.

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apologists. Hence, even under changed conditions, they long clung to this method as the most suited to their purpose. Monotheism, a high standard of morality, and the proof derived from prophecy, ever remained unanswerable arguments against heathen polytheism and corruption. Our Lord's own prophecies, and the vigour inherent in the Christian religion did the rest; and thus the victory of the apologist over worldly wisdom was made complete and secure.

The apologist, too, had to defend Christians in their civil capacity. This course was rendered necessary by the attitude of the Jews, who did their utmost to make the civil allegiance of Catholics suspect. Witness, in proof, the fate of our Lord and S. Paul. The very admonition to obey the higher powers,* given by S. Paul in his Epistle to the Romans, and expressly repeated in the 1st Ep. of S. Peter,† suggests the dangers that were threatening Christians from this quarter. Both letters were written before the persecution of Nero. But this persecution only fanned into a flame the smouldering hatred of the heathen for the Christian. The dark portrait of Christians painted by Tacitus[8] may have received colouring from later times, still it shows that Christians were in bad odour with the vulgar and educated alike. In ancient times the closest connection ever existed between religion and the State. Abstention from public worship was set down not only as atheism, but also as a crime against the State, *i.e.* as treason. Thus, the retired life led by Christians, coupled with the care they took to keep their mysteries secret, of necessity excited suspicions of crime in a world that had lost the very idea of virtue. Hence the first and chief business of the apologist was to vindicate Christians from all unjust charges, whether civil or religious, and thus to cut away the ground from the further charge of atheism and immorality.

The most ancient of these apologies are lost. The two

* Rom. xiii. 1 seq.
† I. Peter, ii. 13 seq.
8 *Annal.* 15, 44.

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earliest, composed by Quadratus, Bishop of Athens, and the philosopher Aristides,[9] were offered to the Emperor Hadrian (126 A.D.) for the purpose of obtaining his protection for Christians, who were both persecuted and misunderstood. Only a few fragments have been preserved of the apologies addressed to Marcus Aurelius by Melito of Sardis (about 170 A.D.), Miltiades, and Claudius Apollinaris, Bishop of Hierapolis.[10] On the other hand, we still have entire the two Apologies of Justin, which are perhaps a continuous work. They furnish a good illustration of the method in vogue among apologists of the second century. The first, which is also the longer, is addressed to the Emperor Antoninus Pius and his sons, and to the Roman Senate and people, and petitions the Emperor to punish nothing but real crime, and to put down tumultuous risings against the Christians. After refuting the charges of atheism, immorality, and treason to the State, he proves from prophecy, and from the moral tone pervading the lives of the Christians, that Christianity is neither an unlawful innovation, nor an impious error. On the contrary, it is the false immoral religion of the heathen that has been founded and propagated by devils. Christians meet in their religious assemblies solely for the purpose of spiritual edification and consolation. These assemblies are so far from being a secret danger to the state, that prayers are offered up in them for all men, even for the Emperor. Justin concludes by expressing the hope that the people will not bring down on themselves the vengeance of heaven, but will at least give effect to the decree of Hadrian. Animated by a like spirit, Athenagoras, the most distinguished defender of Christianity in the second century, addressed an Apology to the Emperor Marcus Aurelius (177 A.D.). He calls upon the State, which allows so much freedom to others in matters of religion, to show toleration to Christians also, who have been wrongly accused of atheism,

9 On the recently discovered fragments see *Kirchenlexicon*, 2nd Edit., p. 1298 seq.

10 The Apology of Melito in the Syrian translation may be seen in Pitra's *Spicilegium Solesmense*, Vol. II. p. xxxviii.-lv.

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Thyestian feasts, and homicide. In his *Apologeticum* (about 197-199), addressed to the Roman Governors of Provinces, Tertullian demands for Christians equal rights with the other citizens of the empire. In itself Christianity cannot be a crime. Christians refuse to worship the gods, not out of hatred to the State, but because it is wrong. Hence, although they do not offer sacrifice to the Emperor, they nevertheless pray for him, and are more sincerely devoted to him than many of the heathen, who are hypocrites. The moral lives of Christians, both in public and in private, are far superior to those of the heathen. The charges of incestuous intercourse and Thyestian feasts are groundless. In his pamphlet *Ad Scapulam*, addressed to Scapula, Governor of Africa, Tertullian warns the Governor not to persecute Christians unjustly. In like manner Cyprian's *Ad Demetrianum* is addressed to one in power.

Apart from the special purpose for which they were written, these apologies contained also a general defence of Christianity. Christian faith and morals were contrasted with heathen immorality and superstition; the good name of Christians was upheld against calumny; truth asserted its supremacy over error and misrepresentation. Moreover, occasionally, in answer to friendly enquiries, the apologists defend Christianity at the bar of reason, in order to show why they dissented from Jew and heathen, and to remove the prejudice that existed against Christianity. Heathen philosophy and mythology were shown to be unsound and hollow, and incapable either of improving the morals or giving a satisfactory reply to the momentous questions about God, the world, and man. But Christian truth, with its foundations deep down in the Old Testament, is much older than heathen wisdom, and presents far better credentials, inasmuch as it is the fulfilment of prophecy. Christianity embraces all truth, sets up the model of a virtuous life, and displays its power by vanquishing devils. It is as old as the

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world. All that is true and good, all that gives gladness and strength to mind and heart, has its origin in revelation, and is in harmony with man's thoughts and desires: all that is good and true is Christian. Christianity is the only true religion.

One of the oldest apologies of this character is the letter *Ad Diognetum*, on the date and authorship of which critics are not yet agreed.[11] It should probably be asigned to the middle of the second century. The superiority of Christianity to the heathen and Jewish religions is pourtrayed in calm and dignified language, and an answer is given to the difficult question, how the world in these latter days was being prepared for the carrying out of the divine plan of redemption. Were the *Oratio* and the *Cohortatio ad Græcos* of Justin undoubtedly genuine, they too would find a place here. In the former, disgust with heathen mythology is given as a reason for conversion to Christianity; the latter endeavours to prove that all truth contained in heathen writers was borrowed from Holy Scripture. The *Oratio ad Græcos* of Tatian, Justin's disciple, is certainly genuine. This was formerly assigned to the year 170 A.D., but recently its date has been fixed between the years 152 and 155, or 165 at latest. Tatian declares his readiness to give an account of the faith that is in him. With bitter sarcasm he lays bare the nothingness of heathen philosophy and religion, which cannot stand face to face with the older truths of Holy Scripture. All the points mentioned above are included in this apology; indeed, it may be said that chapter 29 contains, as in a nutshell, all the apologetic theology of that time.[12] In the third century, the same scornful tone, which is also dominant in Pseudo-Justin, and which was scarcely avoidable in an apology, and still less in an exhortation to the Greeks, is adopted by Hermias in his *Irrisio Gentilium Philosophorum*. Theophilus of Antioch (about 180 A.D.), in three books, retorts simply and effectively

11 For the latest literature on the subject see *Kirchenlexicon*, 2nd Edit., p. 1774.

12 See Harnack *Dogmengeschichte*, 1 vol. Freiburg, 1886, p. 390.

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on the heathen Autolycus the ridicule he had cast on the Christian teaching about God and the resurrection. In beautiful language he describes how God can be known from the works of creation, and how, as Creator, He can raise man to life again. How noble the Christian story of Creation, when contrasted with heathen absurdities! It is confirmed, moreover, by the spirit of the prophets, and by its beneficent action on the life of man. Holy Scripture is older than Manetho's tradition of the Egyptians, and is a safer guide in doctrine and precept than poetry or mythology. Lastly, he declares the charge brought against the morality of Christian assemblies to be false. With his wonted vigour, Tertullian, whose method is to fell an adversary with hard blows rather than to win him over by kindness, follows the same line of argument in his two books *Ad Nationes*: *De Idololatria* and *De testimonio animæ.* Minucius Felix, in his *Octavius*, which was probably written before Tertullian's *Apologeticum*,[13] composes a dialogue, modelled on the dialogues of Cicero, between Natalis Cæcilius, a heathen, and Octavius Januarius, a Christian, in which he handles many of the more notable accusations brought against the Christians. Thus, in answer to the charge of Christianity being a new religion, owing its origin to rude and illiterate men, he appeals to right reason, which justifies faith in God and condemns heathen folly. Tales about the scandalous lives of Christians come with bad grace from the devotees of an immoral mythology. It is precisely the doctrines, lives, and hopes of Christians that call into being that wondrous stoic virtue, which enables them to maintain inward peace even amid the severest trials. S. Cyprian in his letter *Ad Donatum*, and in his treatise *De idolorum vanitate*, was also a worker in this field of apology. In the former work he describes his miserable state before his conversion, and his happiness after baptism; in the latter he walks in the footsteps of Minucius Felix and Tertullian.

13 See Reck, *Theol. Quartalsch.* 1886, p. 64 seq.

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In the second century, owing to the tactics of the Gnostics, the Christian position was vigorously defended all along the line. The chief errors of the Gnostics centred, indeed, in the person of Christ, but were rooted in erroneous notions as to the relations existing between God and the world, light and darkness, truth and error, spirit and matter, good and evil. With this triple dualism,—metaphysical, anthropological, and moral—they sought to shake the two pillars of Christianity, the doctrines of creation and redemption; they established an irreconcilable enmity between the Old Testament and the New; they interpreted various books of the New Testament so as to make them square with their system. Henceforward, the question as to the origin of evil *(unde malum)* dominated all controversy till S. Augustine, by his forcible assertion of the existence of *will* in both man and God, drove Manichæism from the field of science. Only by looking back on the lowering waves of that intellectual flood, can we form a just estimate of the moral energy and spiritual strength of Irenæus, Tertullian, and Hippolytus. Christian foes of heathenish descent were battering the foundations of faith; the duty of their defence fell to the apologists. This duty they owed alike to themselves and to the general body of the faithful. Thanks to their decisive triumph, the Christian Church, at the close of the second century, had won, despite all attacks, a position that commanded respect.

Once this position was made comparatively secure, Christian Apology became invested with a higher, a more general, and a more scientific character. The great Christian Fathers, who had been formed in heathen schools, employed their talents, after their conversion, in defending Christian truths from a general scientific standpoint. The above-named apologists are sometimes reproached with substituting Greek philosophy for faith, and with stamping the Christian religion with a Greek character. A still heavier reproach will be hurled at those Fathers who aimed at building it up into a scientific system

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But the truth is that the utter inadequacy of philosophy had driven the earliest apologists into the arms of Christianity. The later apologists, being thrown among heathen philosophers, were compelled to turn their adversaries' arms against themselves. Divine grace and the moral force of Christianity might suffice for the individual conscience, until the work of reflection began; but when brought face to face with heathen wisdom, these agencies needed supplementing by a deeper and more philosophic unfolding of the faith. The need became still greater when Celsus, Porphyry, Hierocles, and others, not content with repeating the stock calumnies (no longer credited even by the heathen), assailed Christianity as a religious system, with all the weapons of philosophy. S. Paul's argument in proof of the divinity of the Christian religion, that God had chosen the foolish to confound the wise, was pounced upon by the philosophers as a proof that Christianity was unreasonable and deserving of contempt. The danger was increased tenfold when a philosopher mounted the imperial throne and strove, by regenerating the heathen religion, to check the progress of Christianity. And since Christianity contains within itself all that is true in philosophy, and far transcends it in sublimity and certitude, an excellent opportunity was afforded of testing the value of Christianity as a spiritual power. Whilst fully recognizing the good work done by philosophy,[14] the Fathers pointed out that its aim is to ennoble the outward rather than the inward man, and that it can neither inspire right motives of action, nor bring truth and virtue to bear upon eternal life.

This point is briefly demonstrated by Clement of Alexandria, (d. 216) in his *Cohortatio ad Græcos.* In the *Stromata* he gives systematic shape to his views. He weaves, as it were, a carpet of many colours, out of the threads of truth scattered up and down Greek philosophy; and these are united in one web which is held together and made perfect by Christianity.

14 Daniel, *Des études classiques*, Freiburg, 1855. Pastor, *Geschichte der Päpste im Zeitalter der Renaissance*, p. 7 seq., Freiburg, 1886.

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The λόγοι σπερματικοὶ of the heathen are like solitary stars shining in the dark heaven, and preparing for the coming sun, the Christian Logos. As the Law was the Jew's preparation for Christianity, so philosophy was the heathen's. When faith and science are united, faith advances to true science, to Gnosis. Clement is a calm and peaceful disputant, but his disciple Origen (d. 254), the founder of Christian Theology, is decidedly aggressive.

About the year 180 A.D. appeared the "True Word" of Celsus[15]—a work containing every objection that can be urged by Naturalism and Rationalism against Christianity. In it, Celsus, in the person of a Jew, makes an all-round scientific attack on the truths of Scripture, and on the history of Christianity. The necessity of an apology about the year 249 shows that the work had stirred the Christian world to its depths. Origen's eight books against Celsus (only the "True Word" has come down to us) are the weightiest and most comprehensive apology for Christianity that ancient times produced. Of course, having before his eyes the example of our Divine Lord standing silent before the Sanhedrim and Pilate, Origen recognized the truth of Christianity to be abundantly proved by its own inward power, and by the lives of Christians; nevertheless, lest any one weak in faith* should be staggered by the worldly wisdom of Celsus,† he accedes to the request of Ambrose. Christian faith is not the renunciation of true wisdom; the Jewish origin of Christianity should not militate against its teaching; the lowly life of Jesus is no argument against his divinity. The two Testaments contain truths about creation and the angels, the resurrection, and the end of the world, which are far grander than the dreams of Celsus. The name of Jesus is more powerful than the whole heathen Pantheon. In spite of hatred and calumny, in spite of persecution even unto death, Christianity, now so much despised, will one day

15 Keim, *Celsus' Wahres Wort. Aelteste Streitschrift*, etc., 1873. Funk, *Theol. Quartalschrift*, 1886, p. 302 sq.

* Rom. xiv. 1. † Coloss. ii. 8.

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become the dominant religion of the world.

Celsus was an eclectic Platonist, and nearly all the philosophic assailants of Christianity in ancient times were recruited from the ranks of the Platonists.[16] Neoplatonism and Christianity became, as it were, rival religions, with Plotinus and Christ for their respective watchwords. How far the Neo-Platonists, (Lactantius, Porphyry, Magnes and Julian), utilized the "True Word," is a question of no interest except in so far as it enables us to gauge the mischief done by this first philosophic onslaught. Methodius of Tyre, Apollinaris the Younger and others wrote against Porphyry; but their works as well as the fifteen books of Porphyry are lost. Hierocles, an influential politician, and governor of Bithynia (303) wrote a book called "Truthful Words" (λόγοι φιλαλήθεις), to which Eusebius replied, combating in particular the comparison Hierocles had drawn between Apollonius and Christ. Then came Julian the Apostate's ill-starred attempt to wrest the supremacy from Christianity, by restoring a refined heathenism. His prohibition to read the classics was a heavy blow to educated Christians, but it drove them to seek compensation elsewhere. The dogged persistency with which the attack was carried on may be seen from the Apology in eighteen books (ten remain), written against Julian by Cyril of Alexandria in the year 433. Notwithstanding Julian's protest, Cyril and other apologists often retort on heathenism, by showing how little right Julian had either to proceed against Christianity as a conspiracy of Galileans in favour of a human invention, or to hold up to ridicule the sacred books whence all the world's wisdom, from Homer to Porphyry, had been drawn, or to brand the Christian religion as fabulous, childish, irrational, and as the product of a diseased brain.

Nothing was now wanting but a scientific victory over Judaism and Heathenism to confirm and set a seal on the supre-

16 Lösche, *Zeitschrift für wissenschaftliche Theologie*, 1884, p. 257 seq.

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macy of Christianity, which, since the days of Constantine, had been officially recognized by the state. For this reason the controversial element now begins to predominate in the apologies. Hitherto Christians had been attacked and persecuted on all sides; now they sought not merely to retain but also to consolidate and augment the possessions they had won. To this period of transition belongs the *Institutiones* of Lactantius (307—310). By working on a basis at once philosophical and religious, he essayed to bring the true philosophy home to the educated, and the true religion to the uneducated. In this way he hoped to convince unbelievers better than by quotations from Scripture. A great deal is taken from Cicero's *De Natura Deorum*. Of this systematic kind of apology Eusebius (d. 340) may be considered the father. Into his *Præparatio Evangelica* he has condensed the quintessence of the history of religion, in order to show that the new religion, sprung from Judaism, was the legitimate outcome of all the religions that had gone before, inasmuch as they prepared the way for it. His *Demonstratio Evangelica* is an historical demonstration that the Christian religion is intrinsically true; it traces, too, the real connection between Christianity and Judaism. This external historic treatment, on which apologies continued to be modelled, was supplemented by the more philosophic method of S. Athanasius (d. 373), who proceeds to show the truth of Christianity from its central dogma. His *Oratio adversus Gentes* is addressed more particularly to those among the heathen, who looked upon the teaching of Christianity as empty and irrational; the *Oratio de Incarnatione Verbi* gives the scheme of redemption. In common with the Alexandrine School he traces the founding of Christianity to the Logos who was preparing the redemption of fallen man before he took flesh (ἄσαρκος), but accomplished it in the flesh (ἔνσαρκος), and thereby restored man's dignity. As the divine nature of the Logos is resplendent from his miracles

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and character, so the divinity of Christianity is seen from its effects on society and on the lives of individuals. The apologetic activity of this period ceases with Theodoret's *Curatio affectionum Græcorum* in twelve books. With the aid of previous Greek apologetic literature he strove to dispel the many prejudices of the heathen; and he brought together all the points of excellence that elevate Christian faith and morals above worldly wisdom. Even then it could be said with truth: "the Greeks seek after wisdom."*

As far back as the days of Minucius Felix and Tertullian, Christians had been accused of being the cause of the misfortunes that befel the Roman empire. The more rapidly the heathen world was hastening on to its destruction, the more vehemently these charges were preferred. They seemed, moreover, to be justified by the fact that the feebleness of the empire and its approaching disruption became more and more evident after the State had recognized Christianity. From the conduct of the Christians, the older apologists had proved the charge to be unwarranted in particular cases; now it became necessary to review, from a Christian standpoint, the course of the history of the empire and of the whole world, in its entirety; to show the finger of divine providence guiding events that seemed due to chance; and to show that moral corruption was the real cause of decline. This task was undertaken by Arnobius, Orosius, and Augustine. Arnobius (d. about 325), who from an enemy had become a champion of Christianity, probably wrote his *Disputationes adversus nationes* in the early years of the fourth century. The first book only is devoted to refuting the charges just detailed; the other books are apologetic and controversial in a more general sense. In them Arnobius displays a better knowledge of heathen mysteries than of the Christian religion. As idolators made the Christian religion answerable for the

* 1. Cor. 1. 22.

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destruction of Rome by Alaric (410 A.D.),[17] the Spaniard Orosius undertook, on the advice of S. Augustine, to write an historical defence of Christianity. But Augustine's speculative mind was not satisfied with looking at the question merely from without. He took the task in hand himself and accomplished it in a masterly manner in his great book *De Civitate Dei*, written between 413 and 427. The title itself indicates the point of view he takes. In the first ten books he proves that the heathen Roman empire was utterly incapable of making its citizens externally or internally happy. A plurality of gods does not tend to promote happiness on earth (1-5); idolatry can offer no compensation in the next world for the inevitable evils of the present life (6-10). In the twelve following books Christianity, as the city of God, is contrasted, in its foundation and development, with the empire of the world. The book concludes with the prophecy that no power shall prevail against the Church. This part of the work, as it advances, grows into a beautiful Christian theology, and, as a whole, makes such a powerful impression on the mind of the reader, that he unconsciously glides over the weak points that occur here and there in the argument. In the great march of the world's history S. Augustine recognized what he had felt so deeply in his own life. His own life is a condemnation of heathen religion and philosophy, an apology for the victorious power inherent in Christian grace and truth, and a proof of the wonderful ways of divine love. This is the only beacon of light visible to the believing enquirer amid the darkness and turmoil of the world's history. Without divine Providence history seems an entangled skein of contradictions; in the light of that Providence it is the divine education of mankind.

It forms no part of an apologetic history to narrate the many struggles in which the Church was engaged: struggles with Arians, Nestorians and Monophysites which shattered

17 Retractationes II. 43.

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the Eastern, and inflicted considerable injury on the Western Church; struggles with the Donatists in Africa, which imperilled the unity of the Church; struggles with rationalists who were laying siege to the Christian citadel of grace. These strifes within the Church, however, may not be altogether passed over, because they contributed in no small measure to paralyse the power of faith and weaken the Christian empire, and thus to clear the way in Africa and the East for a still more dangerous foe,—Islam. With the advent of Islam our second period opens.

In the interval science had been wholly occupied in completing the doctrinal fabric of Christianity. Mohammed's appearance on the scene and the swift conquests made by Islam were a signal to Christian Communities to cease warring with one another and to unite for the defence of the common weal. Judaism was in alliance with Islam. Both professed a rigid monotheism and rejected the Incarnation. Both were swayed by a certain oriental naturalism. An inveterate hatred of the Christian Church was ingrained in both. But while Judaism fought Christianity with scientific weapons, Islam employed brute force and an appeal to sensuality,—which last element has always played a prominent part in Greek and Eastern religions. Schools of learning were established in Spain and Persia for the purpose of maintaining and giving scientific strength to the ground already won; but they were of a later date.

As Islam and Judaism externally came to an end in Spain in 1492, the close of the fifteenth century would seem to be a correct boundary line. It must, however, be fixed somewhat earlier owing to the long period taken up with the internal intellectual struggle. In the East the case was otherwise. In 1453 the Turks took Constantinople, and continued to press onward to the West. The fall of the Greek Church and the Eastern Empire were concomitants of the Turkish advance. Attempts at union had been unable to prevent the fall of Con-

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stantinople. At that time the Western Church was also in a state of ferment. The Renascence and religious differences had in many ways shaken the Christian Church to its foundations. The character of the fifteenth century is stamped by the Councils of Reform. If to this we add that the horizon of ecclesiastical science had been greatly enlarged by the discovery of America, and of the sea route to India, it will be seen that there are ample grounds for fixing the end of this period at this point. It is also clear from history that in this period, more than in any other, the Western Church, and the Roman Church in particular, constituted the great bulwark of Christianity against the incursions of its foes, whether from within or from without. The schism, by which the Greeks severed themselves from the universal Church, had no small share in bringing about the spiritual and temporal decline of the Eastern Empire. For it was the power and vigour of the Church that had barred the onset of barbarians and the fanaticism of Islam. The minds of the faithful were so deeply saturated with a sense of the Church's power that even apologists drew from it their arguments, and cared little for proofs from history and philosophy. But a new order of things set in with the Reformation, which called in question the entire constitution of the visible Church. Thus apologetic science received a new direction. The Council of Trent, which utilized the results of the science of the Middle Ages to define the faith of the Church, has laid the groundwork of Catholic Apologetics.

To judge by the numerous apologies levelled at Judaism, it must be conceded that it was a living power even at this period. Naturally the Christian argument culminated in the proof that the Messias had already come, and that the Law was abrogated. As, however, Jewish doctrines and precepts were now codified in the Talmud (which served as a guide to exegesis), and as, moreover, the Jews regarded their mystic traditions embodied in the Cabbala as a set-off against the mysteries of Christianity,

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the task of Anti-Jewish apologists was rendered proportionately heavier. A fine opportunity was likewise afforded for the use of irony and ridicule, in which, too, the older writers had not been wanting. The brunt of the battle fell on the West. From the East should be mentioned Gregentius of Taphra in the sixth century, Leontius of Cyprus in the seventh, Anastasius in the ninth or tenth, and the Emperor Andronicus Commenius in the fourteenth.[18] In Syriac and Arabic, it is true, there grew up a rich controversial and apologetic literature around the quarrels in which Jacobites, Nestorians, and Melchites engaged among themselves, and in which these three sects made common cause against Jews and Mohammedans. But this literature is even now little known. The work of the Metropolitan Elias of Nisibis, (d. about 1049) to prove the truth of faith, has recently been translated into German. The first part is devoted to refuting the doctrines of Mohammedans and Jews. In the West a defence of Christianity was rendered especially needful by the learning of the Spanish Jews, whose influence spread to France and Italy. The name of Isidore of Sevile (d. 636), the most illustrious writer of the seventh century, towers above all others. Although himself only a compiler, his works have been greatly requisitioned by later writers. In his *De fide Catholica adversus Judæos*, he appealed to the Old Testament. Agobard of Lyons (876), in his pamphlet, *De Judaicis superstitionibus*, was the first to refer to the Talmud. We have only space to mention the bare names of Rab. Maurus, Gilbert of Westminster, Rupert of Deutz, Peter the Venerable, Walter of Chatillon, and Nicholas of Lyra.

The apologetic writings of Jewish converts are of special importance, because their authors had been educated in the learning of the Talmud, and were familiar with the life of the Jews. They were most competent to refute the charge made even now by modern Jews, that "the Church of the Middle

18 *Dialogus Christiani cum Judæo.* First printed at Basle, 1543. Horst, *Des Metropoliten Elias von Nisibis Buch vom Beweis der Wahrheit des Glaubens, Uebersetzt und Eingeleitet.* Colmar, 1886.

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Ages was compelled to combat and to destroy the Jews because their whole existence was a silent protest against her doctrines." It is well known that many commentators of the Middle Ages, *e.g.* Nicholas of Lyra, sat at the feet of Jewish instructors, and studied Jewish commentaries. Conspicuous among Jewish converts, including Samuel of Morocco, Peter Alphonsus and Hermann of Cologne, was Josue Burki, Private Physician to the schismatical Pope Benedict XIII. (Peter de Luna). After he became a Christian he went by the name of *Hieronymus a Sancta Fide.* In 1413 he held a series of discussions with the Rabbis at Tortosa, many of whom were converted. One of the unconverted rabbis published a controversial work, in which he explained that all matters were of secondary importance, except the unity of God, the divine origin of the Mosaic law, and the doctrine of future rewards and punishments. In reply, Hieronymus wrote two books: *Contra Judæorum Perfidiam et Talmud.* His blows were aimed at two points: the Jew's vain hope of a Messias, and his belief in the perpetuity of the law. He passed severe strictures on Jewish exegesis, chiefly on account of its narrow exclusiveness in adhering to the letter, and in killing every spiritual meaning found even in the Talmud. In conclusion, he gave a collection of the foolish and repulsive contents of the Talmud. The rabbis made a savage onslaught on the book. Isaac Abravanel, (d. 1508), the most distinguished Jewish *savant* of the fifteenth century, entered the lists against it. Another convert and learned commentator, Paul of Burgos (d. 1437), walked in the footsteps of Hieronymus, in a work entitled *Dialogus Sauli et Pauli contra Judæos.* Galatinus, the Italian Friar Minor, also a convert, likewise wrote an apology against the Jews. Contemporary with or subsequent to him were Pfefferkorn, Victor a Carbe, Paul Weidner, Paul Ricci, Paul Elhanon, Christian Gerson.[19]

The East was the first to be summoned to do battle with

19 See the literature in Werner: *Geschichte der apolog. und polem. Literatur*, p. 76. Schaffhausen, 1861. Karpeles. *Geschichte der jüd. Literatur.* Berlin, 1866, p. 640 seq.

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Islam. The Eastern Church and State, as described above, were not in a condition favourable to a contest. Often the sects hated one another and orthodox Christians, more fiercely than they disliked the unbeliever. Hence it not unfrequently happened that they wasted all their shafts on Christians, while commending Mohammedans for their toleration, and merely instructing them in the Trinity and other doctrines. It would not be difficult to show that the triumph of the new religion was due neither to its want of external credentials, nor to its fatalism, nor to its moral degradation of woman, nor to religious conviction, but to sheer brute force and sensuality. John Damascene's (d. 756) work, *Disceptatio Saraceni et Christiani* stamped him as the chief apologist of his time. He was succeeded by his disciple, Theodore Abukara. Of later writers, Samonas of Gaza and John Kantakuzenus, are worthy of mention. The danger did not threaten the West till later. Peter the Venerable (d. 1156), the learned Abbot of Clugny, in his work, *Adversus nefandam sectam Saracenorum*, was the first Western apologist to take the field. A number of scholastics followed in his wake. Some defended Christianity directly against the Mohammedans, others against Jews and Mohammedans conjointly, others again against unbelievers generally. It is then no exaggeration to say that both patristic literature and scholasticism were called into being by the necessity of vindicating the faith.

S. Anselm's *Cur Deus Homo* proves how loudly men were clamouring in his day for a stern scientific enquiry into the fundamental questions of Christianity. By branding as guilty of negligence the man who did not strive to render to himself and others an account of his faith, the saint plainly declared that the need of an apology is created both by the progressive development of religion, and by the attacks of infidelity. The very method was forced on apologists by their opponents. The supremacy of Aristotelianism in scholastic philosophy and theology, was owing to the mighty influence wielded by the

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Moorish and Jewish philosophy in Spain, France, and Italy. Averroism was unbelief disguised as philosophy. Aristotle first came under the notice of Christian teachers in an infidel dress. For this reason the Church at first forbade the reading of his works. Hence arose the necessity of christianizing Aristotle. The chief works of S. Thomas, Albertus Magnus, William of Occam, and others, were translated into Hebrew.

No one will call in question the apologetic tendency of Scholasticism, who is aware to what an extent even the theological works of the schoolmen are devoted to refuting the Arabian and Jewish philosophers of the time. These refutations are of course mostly found in their philosophic writings; still, the real positive answer is given in the theological *summas* which present the whole body of Christian doctrine in a systematized form. *Ab uno disce omnes.* The two *Summas* of S. Thomas will sufficiently illustrate the character of the whole class. In the *Summa Contra Gentiles* the entire Christian revelation is his theme. The first book treats of God, the second of creation, the third of the end and purpose of the universe, the fourth of redemption by Christ. But the method is essentially different from that which obtains in the theological *summas*. Error had to be combatted by reason, because heathens and Mohammedans do not admit the authority of Holy Scripture. By starting from the principle that reason and revelation must be in agreement, since God is the author of both, he sets apologists a pattern to work upon. The distinction between the *præambula fidei* and the *motiva credibilitatis* only means that reason prepares the way for revelation, and shows its credibility. It naturally resulted from the philosophic method that in the first two parts, which stand to one another in the relation of analysis and synthesis, too much attention was bestowed on the formal condition of being, on *movens mobile* and *movens immobile*, and that the *natura rerum* was proportionately neglected. But, even in this undue estimate of the formal element, S. Thomas has been largely followed by apologists.

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At the suggestion of the Kings of Arragon and Castille, Raymund of Pennafort (d. 1275), a man indefatigable in labouring for the conversion of the Moors, in order to train up a race of apologists, established schools for the study of Oriental languages in all the cities of Spain, in which the Moorish population had the upper hand. In the year 1250, Raymund Martini, one of the first students sent by the Chapter of Toledo to prosecute these studies, wrote *Pugio fidei adversus Mauros et Judæos.* The work was so biting that to this very day the Jews label it "Poison." Galatinus, who has been already mentioned, used it largely in his *Arcana veritatis catholicæ.* The Dominicans, Savonarola and Turrecremata, also championed the faith against Mohammedanism. The eleventh Canon of the Council of Vienna (1311) decreed: That in the interests of Scripture Exegesis, and to promote the conversion of unbelievers, professors of Hebrew, Arabic, and Chaldaic, two professors to each language, be appointed in Rome, and in the Schools of Paris, Oxford, Bologna, and Salamanca. At this time appeared the *Propugnaculum fidei adversus deliramenta Alcorani*, by the Franciscan Ricold. Another Franciscan, Alphonsus de Spina, a convert from Judaism, published a valuable work: *Fortalitium fidei contra Judæos, Saracenos, aliosque Christianæ fidei inimicos.* The apologist ranks were swelled by Dionysius the Carthusian, Petro de la Cavalleria, Andreas (Abdallah), Cardinal Cusa and others. Their works were collected and published by Bibliander and Sylburg.[20] Deserving of special notice is the work of the celebrated Orientalist, Guadagnoli,[21] written, by order of Urban VIII. as a rejoinder to the reply of a Persian. *Politius Speculum* appeared against the *Verum Speculum* of a Spaniard. The conversion of the Persian was the result.

The improvement in the relations between East and West,

20 *Syntagma scriptorum anti-muhameticorum.* Basil, 1543. *Saracenica s. Mohamedica*, Heidelberg, 1595.

21 *Apologia pro christiana religione arabice et latine adv. objectiones Achmed ben Zin Aledin Asaphensis Persæ contentas in libro "Politius Speculum" quod aureis scriptum literis misit ad Urbanum VIII. ut ei responderi curaret*, Romæ, 1631.

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which had been effected by the Crusades, had the further result of making the literature of Ancient Greece better known in the West, especially in Italy ; and this literature grew in importance as the Greek empire was approaching to its dissolution. A multitude of scholars, laden with rich literary treasures, fled to Italy, and there propagated the Greek language and literature. Peurbach and Regiomontanus were initiated in the mysteries of Greek by Bessarion. Nicholas Cusa mastered ancient science in Italy, and applauded Nicholas V., with whom Humanism mounted the chair of St. Peter, for the zeal he had displayed in opening up the rich mines of Greek antiquity. Copernicus studied Greek in Italy, and, in all probability, Greek literature also. In the cultured circles of Italy more honour was paid to classic philology and to Plato, its noblest representative, than even to the schools of mathematics and astronomy, which were the pioneers of the Copernican system. Dante, with Aristotle for his master in science, and Vergil as his guide in reason, always traverses the theological ground trodden by S. Thomas.

Not so, however, Petrarch and Boccaccio, the founders of the Renascence. In them the Renascence branches off into a forked road, the one prong being heathen, the other Christian. Petrarch held fast to the principles of the Church. He set greater store by Christian truth than by the wisdom of the ancients, and entered the arena as its apologist. If he himself yielded to sensual passion, his poetry, at least, was free from frivolity and lasciviousness. He and Boccaccio stand in polar antithesis. Although not an unbeliever, Boccaccio had broken loose from his Christian training, and cast moral obligations to the winds ; and he plunged his readers into the slough of heathen sensuality. His most piquant scorn was reserved for the clergy. After his conversion he deplored his errors, and warned people against reading his books.[22]

It was natural that the sensual school should gradually

22 Pastor l.c., p. 1 seq.

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gain the upper hand. The scientific method then in vogue, and the state of politics, gave it an additional attractiveness. It was not in the nature of old Italians to break with the Church or Christianity; but the attack on form, which Humanism was justified in leading, was sure, sooner or later, to rebound on the substance. The Humanist's sense of fine form was shocked by the rough work of the later degenerate Scholasticism. Refined philosophic thought would no longer blend in harmony with rigid definitions, or barren conceptions, or the fruitless hair-splitting of garrulous dialecticians. The new scientific and literary school turned aside not only from Aristotelianism, but very often from belief also. Its rule of life was naturalistic and epicurean. Valla, in his work "On Pleasure," gives a picture of this school. It extolled Epicureanism above Stoicism and Christianity, and put nature almost on a level with God. The consequence to faith and the life of the Church he himself has elsewhere described. Here was an opening for apologists to accommodate themselves to their antagonists' method of attack. It would have been futile and foolish to attempt to bolster up the old form in all its crudeness. Humanism had already taken hold of the educated classes. Progress in culture and science were emblazoned on its banner, and it could appeal to such Fathers as Basil and Gregory Nazianzen to justify its appreciation of ancient culture.

The Heathen and the Christian Renascence grew up side by side. Thus Marsilius Ficinus[23] (b. 1433), the restorer of Platonism, and the idolatrous admirer of Plato, tried to explain and defend Christian revelation in a Platonic sense. Yet he could not completely shake off the Aristotelian influence of the mediæval schools, and in Christian doctrine he often closely followed S. Thomas. His disciple, Pico of Mirandala, sought to enlist both Platonism and Aristotelianism in the service of

23 *De religione Christiana et fidei pietate ad Laurentium Medicem.* 1478. Venetiis 1500. Parisiis 1510. Pico wrote *Heptaplus* and *De ente et uno.*

Christianity. To a knowledge of Platonic philosophy he united wide linguistic and historical accomplishments. To vindicate Christianity on historical grounds was his aim. In substance, he argued, Christianity is as old as religion and man. All the truth in non-christian religions is derived from Christianity. He quoted largely from the Kabbala, which, according to Molitor, obtained its collection of essential Christian dogmas from Jewish and pre-christian tradition. Eugubenus Steuchus and William Postellus took up the same line of argument. Savonarola's (d. 1498) work, *Triumphus crucis contra sæculi sapientes*, was more practical in character. The Spaniard, Raymund of Sabunda (about 1436)[24] treated the question from the scientific side, and constructed, on Baconian principles, a system of natural theology, which was at the same time scholastic in form. His knowledge of natural science was extensive, and his theological learning immense; by fusing the two he sought to explain Christian doctrines by God's revelation in nature. The book of nature has been given to all men without distinction, and offers them infallible truth through the medium of their external and internal experience; the book of Holy Scripture was given to man in the second place, because he could no longer read the book of nature. The same tendency to blend natural science and revealed truth into a system of mystic theology is manifested by Nicholas Cusa (d. 1464).

The most illustrious apologist of the time was Louis Vives (d. 1540). He was born in 1492 at Valencia in Spain, and studied at Paris. The dialectic squabbles provoked by the Nominalists made him a sworn enemy of Scholasticism. At Louvain he became skilled in all the learning of Humanism, and employed his newly acquired scientific and literary attainments to wage war on Scholasticism. As he only knew it

24 *Liber creaturarum sive de homine.* Later editions have put for a title the introduction of the Prologue censured by Clement VIII: *Theologia naturalis s. liber creaturarum, specialiter de homine et de natura ejus in quantum homo, et de his quæ sunt ei necessaria ad cognoscendum seipsum et Deum et omne debitum.*

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in its degeneracy, his judgment is, of necessity, one-sided and unjust. His one-sidedness was censured even by Melchior Canus, who himself severely condemned scholastic abuses. His work against Henry VIII. showed that he had no intention of battling against the ancient faith itself as well as its form. His apology is evidence of his zeal and ability in defending Christian truth. To intellectual refinement and clear judgment he united elegance of style.[25] Intimacy with Erasmus brought him in contact with German Humanism. Humanism was late in entering Germany, but Germany revolted against positive belief more rapidly than other countries. While the older Humanism brought about a justifiable reaction against the methods in vogue, the new Humanism turned its arms against faith and morals. It was essentially the forerunner of the Reformation. From this time forward the defenders of Christianity had to take into account the change in taste and the new intellectual movement. Nicholas Cusa, Pierre d'Ailly, and John Gerson, are instances in point. Although the *Loci Theologici* of Melchior Canus was written a little later, still its method, coupled with its half-hearted defence of scholastic theology, proves that the influence of Humanism had compelled great minds to adopt a more serviceable method in theology and apologetics. This was particularly the case in exegesis, criticism, and archæology. The Reformers took advantage of the movement set on foot by Erasmus and Cajetan and made it serve their turn. Thus the Council of Trent was induced to fix dogmatically the Canon of Scripture. In the matter of nature and grace, sin and free-will, the Council defined the old doctrine with a luminous precision that at once widened the apologists' range of vision, and laid sure foundations for his science to rest on.

The Reformers made but scanty contributions to apologetic science. They were far more anxious to purchase faith at the

25 His work *De veritate fidei Christianæ* ll. 5. Bas. 1543 was, in accordance with his wish, dedicated by his widow to Paul III. It contains (1) *de homine et deo.* (2) *de Jesu Christo, de Trinitate.* (3) *Dialogus inter Christianum et Judæum.* (4) *Dialogus inter Christianum et (Alfaquium Muhametanum).*

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price of free-will, and to array theology in opposition to philosophy. Hence, any scientific exposition, even on the most unpretending scale, was at first neither feasible nor desirable. Their biblical criticism, in like manner, was not scientific but dogmatic, and itself rather called for criticism and required an apology. Not only did they solemnly renounce all demonstration and proof of the Christian faith, but they anathematized every attempt to give an account of its contents as scholastic quibbling. The later Humanists went so far as to allow that faith and reason were in conflict, but with the important proviso that faith was to remain in possession. The axiom of later scholastics, that a thing may at once be true in theology and false in philosophy was shorn of its absurdity, when philosophy was put out of court. Melancthon, however, was more far-sighted. He soon bethought him of the rights of reason, remained an Aristotelian, and strove to establish a connection between theology and human science. Zwingli might rank by his side, did not his shallow explanation of Christian truth, and his subversion of the idea of grace rob all apology, at the outset, of its value. For this very reason, the Reformers were all the more instrumental in aiding the development of Catholic apologetics. The rights of reason, the truth of Tradition, authority, and the integrity of Holy Scripture are, it is true, immediately connected with dogma, but in their character of fundamental principles they are the property of the apologist. Now, as in the fourth and fifth centuries, theology moved chiefly in the shere of controversy, while apologetics were swallowed up in polemics. Suffice it to say that the entire theology on both sides was laid under contribution. It is hardly worth while mentioning names, but we may recall such names as Andrada, Bellarmine, Gretser, Ebermann, Stapleton, Becanus, Suarez. Catholics, moreover, at this period, were wont to identify apologetics with polemics.

The later Scholastics, who flourished chiefly in Spain, con

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tinued to defend the faith speculatively and philosophically. In Spain and elsewhere the progress of biblical criticism helped to stimulate the conversion of the Jews. Sixtus of Siena, himself a converted Jew, laid the foundation of a scientific introduction to the Bible. There is a classical passage in the *Loci Theologici* in which Melchior Canus gives an exposition of the main questions and method of apologetics. The arguments on which Theology rests are authority and reason: authority in the van, reason in the rear (*pedissequa*) Proof of faith is impossible, but arguments from reason are valuable for leading unbelievers to the faith, and for strengthening the faith of them that believe. The theologian's first duty is to explain clearly the teaching of Scripture and Tradition; the second, to defend the faith against heretics; the third, to illustrate and confirm, as far as may be, the teaching of Christ and the Church from natural science. The new-born zeal for establishing missions in India and America contributed largely to the cultivation of apologetics against unbelievers.

For many years all the energy of Protestants was absorbed in controversies with Rome and one another. The first Protestant apologist of note was Philip de Mornay who, in the midst of his campaigns against the Catholic Church, contrived to find leisure to defend Christianity against the attacks of unbelievers. Excepting only Andreas Abdalla, whose work first appeared in Spain, de Mornay was the first to write an apology in the vernacular.[26] It may have been this circumstance that gained for his apology, written in a truly humanistic spirit, unbounded applause. But the conciliatory apology of Grotius[27] obtained the greatest celebrity. Grotius was a man of many parts, a scholar of extensive erudition, classical and cultured, at once blunt and gentle. He had been cast into prison as a remonstrant for conscience sake. It was here he

26 *La vérité de la religion chrétienne.* Anvers, 1859.
27 *De veritate religionis Christianæ.* Lugd. Bat. 1627—Labbadie, *Sur la vérité de la religion chrétienne.* Rotterdam, 1864. Pascal, *Pensées sur la religion et quelques autres sujets.* Paris, 1669.

wrote his apology, which was translated into many languages. In reality the work was only a resetting of an existing book of instruction, written in verse, and intended for sailors. By falling back on antiquity and laying stress on what was universal and Catholic he hoped to win his readers to the one Christian Church. For this reason, at the outset, he built a wall of separation between dogma and apology, and confined himself to the one question: "What can give man rest, comfort and joy during his life on earth, and open out to him a happy prospect in the dark and endless future." The first book treats of God, creation, and miracles; the second of Christ, and the excellence of the Christian religion; the third of Holy Scripture. Books IV., V., and VI., deal with heathenism, Judaism, and Mohammedanism. He bases his proof more on reason and history than on inward experience. The dogmatic parts of Grotius' Apology were continued and completed by Jacob Labaddie.

On the Catholic side, Daniel Huet, the *collaborateur* of the illustrious Bossuet, in his classical work *Demonstratio Evangelica*,* applied the exact method to the historical proof for the Old and New Testaments. Unlike Grotius he treated the Messianic prophecies as direct, but drew no argument from the intrinsic value and character of Christianity. Like Grotius, however, whose plan and arrangement he kept steadily in view, he conceived that all the heathen religions before Christ had sprung out of the Mosaic dispensation. Thus he is a pioneer of French Traditionalism.

Pascal, renowned alike as a mathematician, a powerful thinker, and a brilliant master of style, has, in his unfinished *Pensées*, enshrined profound thoughts in the guise of aphorism. In his day so great was the homage paid to antiquity, even in matters on which its judgment was least trustworthy, that men appealed to it as an oracle, against whose decision there was no appeal, for every idea, absurdity, or mystery. To such an excess

* Paris, 1679.

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was this reverence carried, that the mere text of an ancient author was held to outweigh the strongest arguments. Pascal was dissatisfied. He was far from rejecting the authority of history, but he wished to secure to reason its rights. With keenness of mind and largeness of heart he insists that Christianity has proved a priceless boon to man. But, at the same time, he does not depreciate the value of the external method of proof from the history of the Church and of revelation. Taking man in his present state, with his many contrarieties of thought and will, he shows that no one of the various philosophic sects, nor of the many religions that have existed in all ages, and among all peoples, can satisfy man's desire—a desire that grows with his self-knowledge—to sift the questions that have reference to his origin and end. Holy Scripture alone can supply the desired answer. Its doctrine of creation solves the problem of the beginning and end of things, and its doctrine of the fall casts a lurid light on the misery of sin and the needs of life. But the value of Holy Scripture is enhanced a hundred-fold in our eyes, when we see that it alone makes the essence of religion consist in loving the God whom we adore. Such an exalted ideal we seek elsewhere in vain. It is God Himself who disposes and predicts redemption. The New Testament pourtrays the Son of God made man in such unadorned language, and with such simple and yet striking imagery, that only God could unite so much sublimity with such depths of humiliation. From the Church and the Apostles, Christian truth derived still further confirmation. This masterly exposition was not so much intended to work on the understanding as to captivate the heart with a moral proof. For Pascal knew well that the contending passions in the heart are a more formidable obstacle to religion than intellectual doubt. Once a man recognises his own wretchedness, he will sigh for a Redeemer, and find him. Like Pascal, Louis Bastide considered Christian belief to be most completely assured by the fulfilment of the prophecies contained in the Bible. As, however, the critical

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method of Grotius and Richard Simon seemed to put this argument in jeopardy, Baltus entered the lists against both, and, at the same time, Bossuet came forward as the champion of the Fathers and Tradition against R. Simon.

Humanism had set the ball rolling and, as soon as circumstances were favourable, the principle of subjectivity gave it another push forward. The authority of the Bible itself could not for long hold its ground against rationalistic doubt. The principal attack on revelation, and the historical foundations on which it rested, proceeded from the Arminian and Socinian theologians of the latter half of the seventeenth century. The doctrine of grace, our Lord's divinity, and the entire supernatural order were called in question. Platonic philosophy, in its influence on the Fathers of the Church, was discovered to be the source of Christian truths,—the very theory now being broached by a semi-rationalistic school of theology. Against the accusations framed by Whitby, Leclerc, and Souverain, the Jesuit Baltus[28] pleaded the cause of the Fathers, and explained at some length the relations in which they stood to heathen philosophy and morality. Barbeyraes impugned the morality of the Fathers; Rèmy Ceillier, Buddeus, Stäudlin, and others took up the cudgels on their behalf. Protestants tried to make peace. The morality of Christianity and the Church became the next arena of strife. Thus the way was clear for the inroads of scepticism which, being in itself irreligious, speedily declared war to the knife against Christianity. Bayle and Spinoza opened fire; Bayle contending that reason could not possibly be convinced of revelation or feel its moral force, Spinoza rejecting belief in revelation as inconceivable. In England, distracted by many revolutions in Church and State, Deism was striking its roots deeply and firmly. Hobbes, Herbert of Cherbury, Shaftesbury, Blount, Bolingbroke, and Payne laboured of set purpose to undermine religion. Others, shrinking from ex-

28 *Défense des SS. Pères accusés de Platonisme.* Paris, 1711. Under another title: *Pureté du Christianisme ou le Christianisme n'a rien emprunté à la philosophie païenne.* Lyon, 1838. Cfr. Werner, l.c. 5, 1 seq.

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treme measures, denied supernatural religion, only to set up in its place a pure abstraction, to wit, the lifeless skeleton called natural religion,—a fictitious collection of natural truths which goes by the name of Naturalism or Deism. Deists, such as Toland, characterised Christianity as superstition; others, like Tindal and Morgan, considered it at best but a pioneer of natural religion. All popular religion was branded as a device of priestcraft. Connor, Collins, Woolston, Bolingbroke, and Hume turned their shafts chiefly against miracles; Craig, Toland, and Collins made an onslaught on the prophecies contained in the Old Testament; all without exception, and Chubb[29] most vehemently of all, assailed the authority of Holy Scripture. Chubb's gospel of reason was bounded by natural morality and belief in a future reward.

The ultimate consequences of his Deism, could only be epicurean naturalism and materialistic hylozoism. For natural religion, being a mere negative abstraction of a shallow philosophy, is incapable of nourishing the moral life. Hence a garrison had to be stationed to defend every side that was attacked. Nearly all apologists make some concession to natural religion by placing demonstrations from reason and history in the front rank.

Bacon, of Verulam, professed unbounded respect for supernatural religion. In atheism he saw not the child of deep thought, but the offspring of a depraved will. Between faith and reason he admits a conflict, but faith over-rides reason. From this we may gather the meaning of his statement that deep philosophy leads to God although, in its first steps, it turns its back on Him. The apologists aimed at making faith palatable, and modifying it by reason. The doctrines of eternal life, and the soul's immortality were marshalled against agnosticism. Christian morality was weighed in the balance with heathen immorality. Christianity was represented as a divine

29 *A discourse concerning reason with regard to religion and revelation*, 1730. *The true Gospel of Jesus Christ asserted*, 1738. Cfr. Werner, v. 45.

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institution, attested by miracles and prophecy, which proposed to men the same goal as natural religion, but, at the same time, afforded greater facilities for gaining it.

Atheism was the most formidable antagonist with which apologists had to contend. In this struggle a very active part was taken by Robert Boyle (1626-1691), who established a special prize for the best essay against atheism. Famous among the prize essays thus called forth, were those by Bentley, Durham, and Clarke. They one and all upheld both a natural and a supernatural revelation. And, in proving the necessity of supernatural revelation, they adroitly availed themselves of the very arguments employed by their opponents to advocate natural religion. In part, too, they argued for its utility. This was the course taken by Whitby, Bentley, Clarke, Conybeare, Foster, Watts, Leland, and Berkeley. In this department, so well-suited to their practical character, Englishmen have been eminently distinguished. The proof from miracles was elaborated by Gibbon, Leland,[30] Smalbroke, Pearce, Adams, Lardner, George Campbell, Farmer, Paley, and Addison ; Ditton, Sherlock, Gilbert West, and Chandler, picked up the gauntlet to defend the miracle of the resurrection; the prophecies found champions in Chandler, Sykes, Newton, and Hart. The best proof of the credibility of the history of the New Testament is that given by Nathaniel Lardner;[31] Humphrey Prideaux and Samuel Shukford extended it to the entire Bible history. Alexander Gerard invoked the style of the books of the New Testament as a proof of their trustworthiness; Jennings surveyed the whole internal evidence from this point of view. In addition to the above there are still other names worthy of note,

30 Leland also wrote the first history of Deism : *A view of the principal deistical writers that have appeared in England in the last and present century. with observations upon them, in several letters to a friend*, 1754—(German, 1756). On the Literature, see Werner, v. 102, seq.

31 *The credibility of the Gospel History*. London, 1741-1755, 12 vols. *A supplement to the first book of Part II.* London, 1756, 3 vols. *A vindication of three of our Blessed Saviour's Miracles, in answer to the objections of Mr. Woolston's fifth discourse*, London, 1729. *Collection of the ancient Jewish and heathen testimonies to the truth of the Christian religion.*, London, 1764, 4 vols.

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such as Stackhouse, Chapman, and Bryant, and in this century, Porteus, Everett, Haldane, and others.

Another class of writers based their defence of Christianity on its main doctrines and substance: some, as Hammond, John Locke, Benson, and Bennett, by laying stress on its morality and its conformity with reason; others, like Robinson and Jennings, by showing the inward excellence of its doctrine, or its suitableness to meet the wants of human nature (e.g., Arch, Campbell, and Williamson), or its analogy with nature, like Butler. It is remarkable that, of all these eighteenth century opponents of Deism, Butler alone takes into account the supernatural element of Christianity; yet he, too, regards natural religion as the foundation and chief part of Christianity. Eternal life is man's last end. But Providence must bring this last end within man's reach; this is effected by holding out the promise of reward and punishment. Thus nature gives us a glimpse of the teaching of faith. Christianity, however, is not a mere promulgation of natural religion, but a revelation given for the purpose of restoring and saving fallen man. This is shown by miracles and prophecies, and also by the effects of Christianity; for the importance of religion must be inferred from its effects.

In FRANCE also, an array of writers hostile to Christianity had appeared. Montaigne and Charron in the 16th century, and Sanchez and La Mothe le Rayer in the seventeenth, were profound sceptics. Descartes erected philosophic doubt into a principle in order to give stability to self-consciousness and the knowledge of God. Many adopted his principle without, however, perceiving that the foundation afforded by the *Ego* was not more than empirically secure. From the time of Louis XIV., till quite recently, the Cartesian philosophy reigned supreme in France. Then, again, a despotic royalty, the Gallican tendencies of the clergy, the prolonged struggles with heretics, a policy of aggrandizement and conquest that set morality at defiance, —these and many other causes were at work to make

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French soil produce a plentiful crop of English Deism. Beneath a skin-deep surface of Christianity lay a black mould of scepticism and frivolity that was rotting the foundations of faith and morality in the upper classes.

Refined sarcasm and derision of everything sacred reached their zenith or nadir in Voltaire. He led the attack on the Cartesian School of Theology at a time when Sensists (Locke) and Encyclopædists were showing signs of life. Rousseau and the Encyclopædists pronounced a literary panegyric of atheism. The English Deists had already dissolved the Old Testament in a naturalistic melting-pot; but Voltaire compressed Moses into a myth, and constructed the Pentateuch out of a tissue of Arabian stories. Others saw in Genesis a system of astronomy in the guise of history. The best apologists in the age of Louis XIV. were Bossuet and Fenelon. Both upheld the cause of Christianity and the Catholic Faith, not only by repelling the attacks of the Huguenots but also by building up a good positive exposition of the faith as set forth in Scripture and Tradition. Both favoured the philosophy of Descartes, and with their contemporaries believed that scepticism and materialism would be dashed to bits by impinging on Cartesian Spiritualism. True, if Malebranche's theory of the intuition of all things in God had been the legitimate outcome of Descartes' idealism. Reformers and Catholics made mighty efforts to stem the swelling tide of Bayle's sceptical school. The strength of the Reformers was represented by Abbadie, Leclerc, de la Placette, Pictet, Bernard, Turretin, Lemoine, Holland, and others; that of the Catholics by Hauteville, Dutartre, Tournemine, Lefebre, Bergier, Dubois du Launoy. They plied their adversaries with the usual historical method; trustworthiness of the sacred writers, miracles, and the fulfilment of prophecies. A serried array of Apologists was drawn up to defend the Christian cause against Voltaire: François, Gauclat, Nonnotte, Guenée, Pompignan, d'Aguesseau, and others. The apologetic

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writings of Bergier[32] are especially noteworthy both in their matter and form. The plan adopted in his comprehensive work is first to repel attacks on revelation, and then to state fully the doctrine of the true religion. Chateaubriand[33] worked on other lines, weighing Voltaire's sneers in the balance with the religious, moral, and æsthetic excellences of Christianity, and showing its claim on the gratitude of civilization and good sense. This method, so admirably adapted to the taste and genius of the French, has found imitators even in our own times.

For a long time the heathen school of Humanism continued to bear fruit in ITALY, and the traces of French influence remained. But long and intimate familiarity with the faith they had inherited had made Italians of both schools less sensitive, and hardened them in indifference. For this reason there is little to note in their apologetic history. The controversy which raged round the planetary system of Galileo and Copernicus covered the seventeenth century, and yet it touched only one question of science and the interpretation of Scripture. But with it, as Giordano Bruno made clear, extreme philosophic views were often allied. The vials of scorn and sarcasm which Galileo had poured out on Scholasticism helped to bring theology and faith into disrepute. Nor did Galileo's condemnation mend matters; and yet we nowhere meet with open and avowed hostility to Christianity. Hence Italian apologies are general in character, being for the most part directed against adversaries in foreign lands or those who had lived in the dim past. Segneri's (d., 1695), *L'incredulo senza scusa*, was a shaft aimed at infidelity. Nicolai, Cotti, Roselli, Tassoni, and others treat of the nature of religion and of Christianity. Conspicuous among philosophic apologists is Gerdil[34] (d. 1802), whose scat-

32 *Traité historique et dogmatique de la vraie religion. avec la refutation des erreurs qui lui ont été opposées dans les differents siècles*, Paris, 1780. 12 vols. See Werner, V. 119 seq.

33 *Génie du Christianisme*, London, 1802.

34 *L'immortalité de l'ame demontrée contre M. Locke*, &c., 1747. *Della Esistenza di Dio e della immaterialtà delle nature intelligente.* See Werner v., 125 seq. Valsecchi *Dei fondamenti della religione e dei fonti dell 'impietà.* Libri tre, Padua, 1765.

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tered pamphlets were collected into one volume by Valsecchi. His purpose is to demonstrate the existence of God, and the spirituality and immortality of the soul, and to show that religion is an essential factor in human life. He insists that a divine revelation has been given to man, and that the Christian religion is this divine revelation. In proof he appeals to the truth of its doctrine, to its martyrs, its miracles, and its prophecies, to the moral regeneration of the human race that it has effected, and to the rapidity with which it spread over the globe. Italian theologians (e.g., Perrone) regard apologetics as fundamental theology, and weld dogma and apology into one treatise.

A stream of shallow deism was running through GERMANY also, and that country was gradually swamped beneath a flood of Rationalism and Naturalism. The school of Leibnitz and Wolff admitted both natural and revealed religion; in his *Theodicea* Leibnitz eloquently pleads the cause of both. He tried also to bring about a union of the Churches of Christendom. But Rationalism was the goal towards which the philosophic schools were pressing forward. From the middle of the eighteenth century Rationalism had domineered over all Protestant Theology (excepting that of the Pietists), and had also largely influenced Catholic Theology. Semler and Ernesti applied Rationalism to the study of the Bible. The Wolfenbüttler Fragments of Reimarus and Lessing stirred the country from its inmost depths by storming the citadel of Christanity in its central miracles. Then the day of "enlightenment" dawned on the world. Reason was constituted supreme judge in the matter of religion. Inspiration, supernatural revelation, and the divine foundation and constitution of the Church were mercilessly slaughtered at the shrine of pure reason. Men constructed a natural religion for themselves by eliminating from Holy Scripture everything that transcended reason, or that smacked of the supernatural and miraculous. From the slender materials that remained they thought to erect a breakwater power-

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ful enough to beat back the swelling waves of infidelity. In this we may see the lines on which apologies of that time moved. An apology, at once deep and convincing, and drawn from the sources of faith was a *rara avis*. The *Leit-motiv* of all apologies, even the best, is the intellectual side of revelation. Pfaff, Mosheim, Haller and Zimmermann erected barricades against unbelievers in revelation. The work of Lilienthal [35] is sometimes put on the same footing with the works of Lardner and Bergier; but it lacks order and precision. Nesselt, Less, Spalding and Jerusalem are more methodical, but more deeply tinged with Rationalism. Herder and Lessing think that the onward march of the human race to progress abundantly compensates for the loss of that faith in Scripture which criticism had rudely shaken. They wanted to separate the truth contained in the Christian religion from its historic forms, and to temper it into an exquisite harmony with true reason. But such a separation would be fatal to faith. So Tobler, Döderlein, Less, Michaelis and Semler picked up the gauntlet thrown down by the Fragments, and Lüderwald, Seiler, and Mass entered the lists against other works of a similar tendency. The apologies of Seiler, Klenker, Reinhard, and Köppen have a more general drift. As Catholic Theology was not directly assailed, its apologists confined their attention to general questions. Stattler[36] who had drunk deep of the spirit of the Wolffian philosophy, composed a systematic apology for Christianity. He lays the greatest stress on the possibility and necessity of revelation, and on proving that the Catholic Church is its guardian and exponent. Bede Mayr's apology was enthusiastically applauded. In his clear careful treatises he makes good use of the materials collected by Bergier,

35 Die gute Sache der Offenbarung. Koenigsberg 1750–1782, 16 parts. Less, *Beweis der Wahrheit der christlichen Religion*, Göttingen 1768.—Jerusalem, *Betrachtungen über die vornehmsten Wahrheiten der christl. Religion*, Braunschweig, 1768. 5th Edition, 1776. Klenker, *Neue Prüfung der Beweise für die Göttlichkeit des Christenthums*, Riga, 1787 to 1794. 3 vols. Reinhard, *Versuch über den Plan, etc.*, Wittenberg. 4th Edition, 1798. See Werner l.c. v. 131 seq.

36 *Demonstratio Evangelica*, Aug. Vind. 1771. 2 vols.—Beda Mayr, *Vertheidigung der naturlichen und katholischen Religion*. Augsburg, 1787–1789. Storchenau, *Philosophie der Religion*. Augsburg, 1772–1789. 11 vols.

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Döderlein, Less, Eichhorn, Klenker and others, to combat French and German infidels. Storchenau's work is still more comprehensive. Veith and Sandbichler came forward as champions of Holy Scripture. But at that time, even Catholics were unequal to the task of producing an extensive apology for Christianity, that viewed the Church as a social power among men and as the visible manifestation of the God-man, Jesus. They enlarged on the blessings and civilization that Christianity had conferred on mankind, but they were unable to give a picture of the entire life of the Christian Church, and thus to refute the objections raised against certain phenomena in its development.

In the nineteenth century the apologist has had to contend all along the line with the after-effects of Rationalism, which continued to subsist in philosophic pantheism and in the so-called historical school of biblical criticism. But the natural sciences proved a far more dangerous foe of revelation. For their exact method and the astonishing progress they have made fascinate the minds of men, even when they overstep their bounds and claim as their own every department of science. The objects of natural science are manifold. On the one hand it aims at extending the sovereignty of the senses; in its positivist character, it challenges all knowledge of the ideal and supernatural, and even preaches rank materialism and naturalism. On the other hand, in the theory of evolution it offers a positive solution of the enigmas of the universe. This theory however is not limited to natural science, but is gradually encroaching on the domains of history and philology and the social science. Here, too, the apologist has his work mapped out. Apologetics has been constituted a philosophical and theological science, to arbitrate between the conflicting claims of theology and worldly wisdom, of faith and science.

In France, at the beginning of this century, a gradual restoration of the religion, overturned by the Revolution, set in. First principles had to be inculcated anew. Chateaubriand's plan of drugging unbelieving minds with æsthetic and physiological

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arguments was tried. When the ruins of the revolution were being scattered to the winds before men's eyes, it was easy to galvanize their minds into thinking that Christianity was of vital importance to domestic and civil life.[37] Under the legitimist monarchy, royalty and priesthood were united by sacred ties ; under the July monarchy, the Church was applauded as the mother of civilization and progress. Lamennais, the great worshipper of Tradition, and the enthusiastic advocate of liberty, struck off the fetters of indifference that had enchained many souls. His pupils retained his enthusiasm without adopting his errors. De Maistre, Montalembert, Dupanloup, Barran, Pauvert, La Chadenède, justify faith before the tribunal of reason ; Nicolas reduces the entire Christian Philosophy to system ; Laforet gives a speculative exposition of the teaching of the Church ; Martinet, Louay, Chassay, Deschamps, are formal Apologists. Ravignan, Ventura, Lacordaire, P. Felix, Hyacinthe argued the great questions of the day in conferences, with a brilliancy of diction and an impetuous flow of eloquence that held their hearers spell-bound.

In the France of our own day Apology has acted a still more prominent part. The injury inflicted by the old and new Revolution has been increased by the havoc caused by Positivism and Darwinism, and by Renan's attack on the history of Religion. Christian *savants*, who still live in hopes of thoroughly healing the grave diseases from which French society is suffering, are trying to stave off the crisis by issuing special apologetic periodicals, and by holding international congresses with the

37 Frayssinous, *Défense du Christianisme, ou Conférences sur la religion*, held in 1803–1809 and 1814–1822, Edited in 1824 ; translated into German and Italian. These are some of the works referred to in the list: *Dupanloup, Le Christianisme présenté aux hommes du monde par Fenelon*, Paris, 1847, 6 vols., 4th Edition. Nicolas, *Etudes philosophiques sur le Christianisme*. Paris, 1850, 16th Edition, 1855. *Chassay, Catéchisme historique des incroyants*, and, *Preparation évangelique du XIX Siècle*, cfr. Werner, p. 221. Lacordaire, *Conférences*, Paris, 1855, 3 vols. The Review, *La controverse, Revue des objections et des réponses en matière de religion*, Paris, 1880 ; now under the title *La controverse et le contemporain*. *Annales de philosophie chrétienne*, Paris, see *Theol. Quartalsch*. 1883, page 78. *La science catholique*. *Revue des questions historiques*. But *Revue de l' histoire des Religions* is mostly in the hands of rationalizing *savants*.

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avowed object of arming and manning the defences of faith.[38] The necessity of strengthening the Christian arsenals and fitting out a Christian squadron will not be questioned, when it is considered that, in the Collége de France, there is not only a chair for the comparative study of religion but that, since 1886, a special department has been opened for these studies with the view of destroying the denominational character of religious instruction. Of apologists in the field of natural science I may mention Moigno, Elie de Beaumont, Quatrefages, Lenormant, Hamard, Bourgeois, Haté, Motais, Janet, Raingeard; and of anti-positivists, P. de Bonniot Pernet, Broglie, Duilhés, Pressensé, Arduin, Robiou, Jacquinot. As the radical school of biblical criticism has, owing chiefly to the labours of Renan, spread its roots over a large extent of France, apologists are trying to revive the study of biblical exegesis which had long been defunct. Faivre, Harlez, Bonniot, Le Hire, Fillion, Camus, and Lamy, are names that rise to the lips at once. But the most distinguished biblical scholar is Vigouroux, who is more constructive than Lenormant.[39] From the evidence furnished by recent discoveries in Egypt and Mesopotamia he has successfully vindicated the history of the Old Testament against its numerous traducers. The *Revue des questions scientifiques*, published in Brussels, deals mainly with scientific subjects, and gives proof of varied learning and great ability. Sometimes, too, it has occasion to examine the history of religion and of the Church, because Catholic countries are reproached with lagging behind in the march of civilisation. But the glorious history of the Latin nations shows that the blame does not rest with the Catholic Church.

In ENGLAND, the great agitation for Catholic Emancipation called forth a host of writings, bearing principally on the *demon-*

38 See *Philosophie chrétienne* 1866, No. 4. In No. 2 and 3 there are also articles on the progress aud method of French apologetic science.

39 *La bible et les découvertes modernes en Palestine, en Egypte, et en Assyrie*, 4 vols, Paris. *La Cosmogonie mosaïque*, 1 vol.—*Manuel biblique, ou cours d'écriture Sainte*, 4 vols. *Les livres saints et la critique rationaliste*, 2 vols, Paris, 1886. Kurk, *Les origines de la civilisation moderne*, Louvain, 1886.

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stratio cathòlica, but likewise embracing a defence of Christianity; to wit, the writings of Fletcher, Milner, Baines, Butler, Moore, Mac Hale, and Cooper. Of eminent importance are the works of Wiseman and Newman, some of which have been translated into German.[40] Murray's work is, in great part, a controversy with the Puseyites. In the cradle-land of Darwinism, as elsewhere, the defence of Christianity has latterly centred in controverting the doctrine of descent. The most distinguished writers on the Catholic side, who have dealt with this question, are Professor St. George Mivart and Bishop Clifford. The former has, from a Catholic point of view, treated Darwinism with great freedom, and attempted to grapple with the problem, how far, with certain necessary modifications, it is admissible as a working hypothesis; the latter has proposed to remove all difficulties by allowing a very wide margin in interpreting the Hexæmeron. Conspicuous on the Protestant side were the *Bridgewater Treatises*, which[*] originated in a foundation left by the Earl of Bridgewater, who died in 1829. Their purpose was to demonstrate the truth of the Christian cosmogony by showing the existence of design in the different kingdoms and orders of nature At present all interest centres in Darwinism, and in attempts to reconcile it with the Mosaic history of creation. Powell, Warrington, Haughton, Woods Smythe, Stanley, and the Americans, Asa Gray, McCosh and Hedge, have written in this sense.

In ITALY the struggle against indifference and unbelief is now more severe than ever. Materialism and the Philosophy of Hegel were poured in from Germany; Positivism streamed in from France; natural science and the comparative study of religion have been undermining the faith of the educated classes. The work of devastation proceeded apace, as, till recently, apology had moved along the old beaten track, and theology had to some extent degenerated into formalism.

40 See Werner v. p. 210, seq. Wiseman. *Lectures on the Connection between Science and Revealed Religion.* Murray. *De Ecclesia Christi*, 3 vols.. London, 1860.

* 11 vols., 1836. Translated into German.

The idealism of the ontologists had led to conflicts with the Church. Only in modern times have things taken a turn for the better. Nardi wrote a *demonstratio catholica*; Alberi defended the Christian position against the wild charge of naturalism. Palmieri, Tongiorgi and others attempted to show that the Christian doctrine of creation is compatible with modern science. Secchi [41] took in hand the task of proving scientifically the unity of all nature, and thus justifying the Christian theory. In consequence of the recent Encyclical of Leo. xiii., a network of Thomism is again spread over the whole field of theology. In academies of S. Thomas, and in periodicals (e. g. *Civiltà Cattolica*, and *Scienza e la fede*), the Scholastic natural philosophy is put forward as the correct solution of the fresh dispute between science and faith. The editor of the *Civiltà*, P. de Cara, has also combatted with success the destructive tendencies of philology and the comparative science of religion.

SPAIN is in a similar condition. Here also a beginning is being made, and Thomism is represented as the ark into which all must enter who wish to be saved from the deluge of modern naturalism. The works of Balmes[42] were, in their day, widely circulated in Europe. The same seems to be true of later Thomistic writings e.g.: The philosophy of S. Thomas by Gonzalez, and the Apology of Oeti y Lara. The latter was a prize essay which the royal academy of moral and political science ordered to be written in reply to a Spanish translation of Draper's *History of the Conflict between Science and Religion* (1873).

41 *L'unità delle forze physiche.* Also two papers on the grandeur of creation read in 1876 and 1877 before a scientific association and received with great applause. He has also written other works on the sun and stars. P. de Cara *Esamé Critico de sistema filologico e linguistico applicato alla mitologia e alla scienza delle religioni* Prato 1884.

42 *Fundamental Philosophy*, *Letters to a Sceptic*, *Catholicism and Protestantism compared*, were translated into several languages. Oeti y Lara wrote a work to show that science and revelation are in complete harmony. There is also a periodical, *Ciencia Cristiana*.

Various circumstances have combined to give an impetus to the study of apologetic science, and to give it a growing importance in Germany. Kant's *Kritik* had shaken faith in an objective knowledge of God and revelation. The philosophic development which began with Kant, and led to Pantheism in Fichte and Hegel, and to natural mysticism in Schelling could not but exercise a deep influence on theology and faith. The so-called historical school in biblical theology seeks to explain history as the dialectic process of certain ideas, and to put the history of the Christian Religion on the same footing as the mythical religions of antiquity. The feeling of absolute dependence, with which Schleiermacher strove to adjust the conflict between faith and science, makes the religious experience of the subject the measure of judgment, and sacrifices all objective certitude of metaphysical facts and truths. The extreme schools of natural science have likewise found supporters and disciples more rapidly in Germany than elsewhere. This sketch indicates the course apology has taken. The works of Drey,[43] Staudenmaier, Denzinger and Ehrlich are philosophical. Liebermann, Klee, Reinerding, Schwetz, Sprinzl and Hettinger have written fundamental theologies. The apologies of Hettinger and Vosen are more general in their scope. Weiss bases his defence of Christianity on its moral teaching. Against the destructive biblical criticism of Strauss, Renan and others, the reader may consult, besides Introductions and Lives of Jesus, the Critiques of Hug, Haneberg, Brunner, and others.

43 Some of tne principal publications of the above-named authors are the following—Drey, *Die Apologetik als wissenschaftliche Nachweisung der Göttlichkeit des Christenthums in seiner Erscheinung.* 2 Aufl. Mainz, 1844.—Staudenmaier, *Philosophie des Christenthums.* Giessen, 1840.—Denzinger, *Vier Bücher von der religiösen Erkenntniss.* Würzburg, 1887.—Ehrlich, *Fundamentaltheologie.* Prag, 1859. Sprinzl, *Handbuch der Fundamentaltheologie*, Wien, 1876, *Lehrbuch der Fundamentaltheologie*, Freiburg, 1879—Hettinger, *Apologie des Christenthums*, 3 Aufl. Freiburg, 1856—Vosen, *Das Christenthum und Einsprüche seiner Gegner*, 4 edit., Freiburg, 1881. *Der Kalicismus und die Einsprüche seiner Gegner*, 3 edit., 1885—Weiss, *Apologie des Christenthums vom Standpuncte der Sittenlehre*, 4 vols , Freiburg, 1878—Reusch, *Bibel und Natur*, 3 edit., 1870, 4 edit., 1874, Bonn—Güttler, *Naturforschung und Bibel in ihrer Stellung zur Schoepfung*, Freiburg, 1877—Lorinser, *Das Buch der Natur*, 7 vols., Regensburg, 1876—Schäfer, *Bibel und Wissenschaft.* Münster, 1881—Pesch, *Die grossen Welträthsel. Philosophie der Natur*, Freiburg, 1883, 1884, 2 vols.

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To defend Christianity against the batteries of science Michelis established the periodical *Nature and Revelation*, which has rendered yeoman's service. Other authors worthy of special mention are Reusch, Huber, Michelis, Weith, Westermaier, Hummelauer, Güttler, Lorinser, and Schäfer. Of late the Jesuits Pesch, Dressell, Epping, &c., have been busy discussing the principal questions of natural philosophy. For a long time the influence of Kant, Schleiermacher and Hegel made itself felt on Protestant theology. In the school of Ritschl, Kant is to this day a living power. Speaking generally we may say that all Protestant apologists have agreed not to lay great stress on external proofs for the existence of God and revelation, but to rely chiefly on moral and religious experience. Even in biblical criticisms many concessions have been made to the negative school. Still it must be acknowledged that in recent times they have made great efforts to maintain their ground. Apart from the many lives of Jesus and general exegetic literature, we may mention as authors of apologetic works proper, Tach, Delitzsch,[44] Luthardt, Düsterdieck, Zegschwitz, Voigt, Frank, Ebrard, Baumstark, Dorner. The chief apologist in natural science is Zöckler, in whose works are to be found further details on the literature of the subject. He also defends the interests of Christianity in the periodical *Beweis des Glaubens.* Of naturalists who have written against Darwinism, besides the French Quatrefages, should be mentioned the names of Wigand, Baer and Pfaff, who supply abundant materials for the defence. Max Müller's writings furnish an introduction to the comparative study of religion.

44 *System der christlichen Apologetik.* Leipzig, 1869—Luthardt, *Apologetische Vorträge*, Leipzig, 1864. Last edition 1883. Düsterdieck, *Apologetische Beiträge* Göttingen, 1865–1872. Zegschwitz, *Zur Apologie des Christenthums nach Geschichte und Lehre.* Leipzig, 1886. Frank, *System der christl. Gewissheit* (2nd edit.) Erlangen, 1881, Ebrard, *Apologetik* (2nd edit.) Gütersloh, 1874—Baumstark *Christliche Apologetik auf anthropologischer Grundlage.* Frankfort, 1872—Dorner, *System der christl. Glaubenslehre*, 1 vol.—*Grundlegung, oder Apologetik*, Berlin, 1879—Zöckler, *Geschichte der Beziehungen zwischen Theologie und Naturwissenschaft.* Gütersloh, 1877–8, 2 vols., Wigand, *Darwinismus und die Naturforschung Newtons und Cuviers.* Braunschw., 1874, 3 vols—Baer *Studien aus dem Gebiete der Naturwissenschaften.* Petersburg, 1876—Pfaff, *Schöpfungsgeschichte* (3rd edit.) Heidelberg, 1882.—*Die Entwicklung der Welt*, 1883—For the history of apologetics it is enough to refer to the works of Werner and Zöckler already quoted. Hurter's Nomenclator and Dorner's History of Protestant Theology are also very serviceable.

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CHAPTER III.

RELIGION AND HISTORY.

Civilization, throughout the length and breadth of its history, furnishes no phenomenon so widespread and so far-reaching in its consequences as Religion. The faint light that breaks upon us from the early dawn of civilization shows that human knowledge and morality originated in religion, that religion is the well-spring from which the first songs of soul-thrilling poetry were drawn, and that religious worship was the parent of the first-born of art. In Iranian and Indian documents, in Egyptian hieroglyphics, and in the cuneiform inscriptions of the Chaldeans, religion everywhere asserts its claim to be considered the chief and most influential factor in the life of families and of nations. The history of religion is the history of man. It is the groundwork and the key to the right understanding of all history.[1] Our knowledge of antiquity has advanced by leaps and bounds: yet it offers no explanation of the fact of religion, but merely bears witness to its existence in the remotest ages. Both civilized and uncivilized races tell the same tale. If ancient writers[2] had asserted that belief in a God was universal, and that there existed no people so savage and lawless as not to worship some God or other, the statement might have been set down as a hasty or superficial generalization, due to their comparatively narrow knowledge of ethnography. Even the Fathers and the learned men of the Middle Ages knew but little of the inhabitants of the various parts of the globe. Now, however,

1 Max Müller, *Essays.* 2nd Edit., 1879, Vol. I., p. 19.

2 Odyssey, iii. 48, Arest. *De cælo* 1, 3, Cicero, *De Nat. Deorum* 1, 16, 17; 2, 4, 5. *De legg* 1, 8. Seneca, Ep. 110, 117.

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circumstances are altered. The discovery of two continents and numberless islands, and the exploration of the "Dark Continent," have widened to an unforseen extent the circle of human knowledge. And yet all modern discoveries in ethnography and anthropology do but confirm the ancient truth. No nation has yet been discovered wholly devoid of religion.

Writers of the Darwinian School, such as Sir John Lubbock and Haeckel, have had the hardihood to assert that there are men in Southern Asia and Eastern Africa, going about in droves, living on the fruits of the earth, unacquainted with fire, using stone weapons and implements, and spending most of their time in climbing trees, like apes of the higher class But even such staunch Darwinians as Hellwald and Caspari allow that this contention smacks more of romance than of history. The alleged tribe is a creation of fancy without a definite abode. It was a favourite dodge of Bayle and the sceptical school to justify atheism by pointing to the existence of tribes with no religion. Of course there have been explorers who have in all sincerity written in this sense. Livingstone asserts that no trace of religion was to be found among the inhabitants of Bechuanaland; Samuel Baker, Dalton, and Lichtenstein say the same of South African and American tribes; Messenger Bradley makes a like statement about an Australian tribe. Sir John Lubbock appeals to the testimony of Catholic and Protestant missionaries. In like manner, the Abbé Lesserteur, Professor of Theology at the Seminary of Foreign Missions, maintains that the knowledge of God is not universal. In support of his thesis he cites the *Missions Catholiques* of 1881, in which[3] P. Berengier says that the Arraconians of Bengal have no idea of the existence of a Supreme Being; but they believe that brooks and trees are peopled by mysterious spirits. Moreover he quotes Mgr. Bourdon, Vicar Apostolic of Burmah, as saying that the Kachyens have not the least notion of an eternal, almighty, and infinite

3. P. 69—*La Connaissance de Dieu est elle universelle? La Controverse*, 1885, No. 58, p. 660-9.

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God, the creator and sustainer of the universe, who will reward the good and punish the wicked. In the same category he places the Annamites, who believe in higher orders of spirits, for the most part wicked and terrible; but he insists that this belief cannot be described as a knowledge of God.

In saying so much, however, Lesserteur has made his meaning clear If for the knowledge of God he requires "the idea of a supreme being who created heaven and earth, and is the sovereign Lord of all things," this exalted notion will not easily be discovered among savages. But it is hardly fair to test the faith of low savages by our own enlightened ideas about God. Nor, again, should it be forgotten that the conduct of a savage, from which alone his belief can be gathered, is often reserved and difficult to understand. For this reason we must observe great caution in receiving the depositions even of travellers and missionaries. Long years of patient observation, thorough knowledge of the country, and familiar and confidential intercourse with the natives are the only security against error. In the presence of white men savages are often reticent, being afraid to mention the names of their gods. In this way many contradictory statements may be explained. A little while ago the Zulus were credited with having no religious ideas of any kind; now, missionaries are often puzzled by their subtle questions. They believe in an invisible God, dwelling in the heavens, who created all things, and guides the destiny of man.[4] Roskoff has confuted Sir John Lubbock in detail; Quatrefages has done a similar service to the stories of the missionaries;[5] Tyler, Peschel and Max Müller have defended the same thesis with success. In the last instance the pivot on which the whole dispute turns is the question as to how much is essential to the idea of religion. Sir J. Lubbock himself admits that it will be difficult

4. Max Müller, *Einleitung*, &c., Strassburg, 1874, p. 52, 232 seq.

5. Roskoff, *Die Religion der rohesten Naturvölker*, 1880. Gloatz, *Speculative Theologie in Verbindung mit der Religionsgeschichte*, 1 vol., 1883, p. 96, seq. Quatrefages, *L'espèce humaine* and *Controverse*, 1882, No. 51, p. 704. See also Reville, *La religion des non-civilisés*, *Revue de l'histoire des religions*. Juillet et Août, 1880. Gutberlet, *Gibt es Völker ohne Religion? Natur und Offenbarung*, 1885, No. 1, 2. W. Schneider, *Die Naturvölker*, 2 Part. Paderborn, 1886, p. 347 seq.

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to find any savages without religion, if magic in large or small quantities is allowed to do duty for religion. He grants that religion is common to all men, if religion is made to include a mere dread and consciousness of beings more powerful than ourselves. But he thereby concedes in principle the universality of religion.

Even superstition and magic, howsoever debased and degraded, are an evidence of faith and of religion. Sacrifice and prayer are constituent elements of both, though the one be repulsive, and the other meaningless and mechanical. Both magic and superstition have for their object union with a superior being; both are an acknowledgment of man's dependence on a superior power; both point to the need of reconciliation with the powers above. Inseparably linked with these rites is belief in immortality. Whatever construction we put upon this belief, it is invariably associated with religion, and shows itself in the belief that man is destined to lead a happy life in the world to come in the company of invisible spirits and the ancestors who have gone before. Hence the worship of the dead, which is so common amongst savages that it forms the centre round which their religious ceremonial revolves.[6] Formerly it was said that the negro races stood alone in denying the immortality of the soul; yet even they believe in it. The various funeral customs that prevail in Africa and the South Sea Islands are, indeed, a disgrace to humanity; but they serve to show that these tribes believe that there is a life beyond the grave. The African religions have, therefore, long ceased to be classed as fetichism pure and simple. In the obscure creeds of the black races, we can now find distinct traces of serpent worship; the duty of reverencing ancestors is strongly inculcated; a gloomy, morose belief in a future life pervades them, yea,—through the chinks there dimly shines the recollection, never wholly extinguished, of a supreme God who is equally the Father of white men and of black men.[7] Then, too, the inhabitants of the islands dotted

6. W. Schneider, *Der neuere Geisterglaube*, Paderborn, 1885, p. 25—Nadaillac, *Die ersten Menschen*, Stuttgart, 1884, p. 408 seq.

7. Max Müller, l.c. p. 108.

about the Pacific and Indian Oceans, Malays, Papuans, and Polynesians have some notion of sacrifice and prayer, some idea of a Divine Being; they, too, are buoyed up by hope in a life to come that will never end. And archæology enables us to discover the footprints of funeral rites even in prehistoric times.

No people exist in whom the idea of morality has not taken root. Ethics had long been the hinge on which popular philosophy turned. Socrates limited philosophy to ethics. Morality postulates faith, and is at once a proof and a product of faith. The laws of man are founded on the commandments of God, and, in point of time, religious notions are prior to the distinction between good and evil. The moral law is enthroned on a higher pedestal.[8] This is indeed denied by some anthropologists of note, like Taylor and Waitz; but here again it is a question of defining terms. Morality is often made to consist wholly of the most trivial outward observances; nevertheless it is founded on the distinction between good and evil, as between man and a power above him. With morality were frequently bound up the dread of punishment and the desire to be purified and redeemed. Thus religion became an engine of education and a means of ameliorating the condition of mankind.

The picture drawn of the moral life of savages is indeed dark and full of horrors. But were civilized races any better in the early ages? Does not the idea of religion rise to the surface of the surging floods? May it not regain that influence for good which it once had? Cannibalism originally existed everywhere. It overran Europe and Asia, devastating the fair provinces of Italy and France, England and Germany. In the opinion of many savants, it can be traced in the religion of the Old Testament. It was flourishing in America when Columbus landed. It is still a power in Africa, Asia, and Australia.[9] At the present

8 Peschel, *Völkerkunde*, 3rd Edit., Leipzig, 1876, p. 264.

9 W. Schneider, *Naturvölker*, I. p. 121 seq., p. 186 seq.—Schaaffhausen, *Anthropologische Studien*. Bonn, 1885, p. 516 seq. Nadaillac, l.c. p. 238 and 294 seq. *Revue des Deux Mondes*, LXVI. (1884), p. 1405 seq.—Max Müller, *Essays*, I., 1879, p. 58 seq.

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day five millions and a quarter of men are its slaves. At times men may have been instigated to it by hunger, or a craving for human flesh, or by the desire to kill an enemy out of revenge, and thus make his bravery their own; but at bottom its motive is superstitious and religious. Men make their gods as cruel as themselves, and strive to propitiate them with human sacrifices. The Mexicans offered up to their god a heart "in order to renew the youth of the natural forces that sway the universe;" and they took the heart out of the noblest of living beings,—man. The same idea finds expression in the savage cruelties perpetrated in the human sacrifices of the Aztecs,—cruelties that spread to an alarming extent among other races and cities. The men themselves partook of the sacrificial meal. Religion looms behind the ghastly human sacrifices that take place at funerals. As suicide among Hindus has a religious motive, so the variety of views about this life, and life in the world to come, accounts for all such revolting barbarities in family and tribal life, and an explanation of many of them must be sought in that love which endures beyond the grave.

What, then, does religion mean? In the wider acceptation of the term, religion includes the distinction between good and evil, and a confession that man is weak and dependent on higher powers who can influence his destiny; another of its ingredients is the belief that man will live after death. In this sense religion is as old as mankind, or at any rate as old as historic man. These radical constituent elements of religion are visible to the naked eye on every page of history. But, it will be asked, is not modern society saturated with atheism? Is not independent morality advocated by philosophers? In reply the counter-question might be urged: Has there ever been a time or country in which men of gigantic genius and wide knowledge have not believed in the supernatural? In presence of this striking fact, Renan feels uneasy in his Deism. Littré felt it to be a rock too firm for him to shake; before his death it shook his views. This happy result does not always come to pass; but then external causes block the way. Speaking generally we

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make bold to affirm that thorough-going atheists are fewer than is commonly supposed. They tell against the universal fact of religion just as much and just as little as the existence of unscrupulous men is a proof that no such thing as conscience exists. Occasional cases of atheism are not inexplicable phenomena. External surroundings, education, and one-sided studies, bad example and prejudice, perversions and caricatures of religion, and the pernicious effects of pride and evil living, are quite sufficient to account for them.

But even these men reveal the religious basis within them in the need they feel of providing a substitute for religion. The educated classes, who have emancipated themselves from the thraldom of religion, are, as all the world knows, hot-beds of superstition. Are not the vagaries of modern spiritualism in everybody's mouth? But infidels look for a substitute elsewhere. "We claim," says Strauss, "for our universe as much piety as our old-fashioned friends demanded for their God. If you ask, have we still any religion? I answer yes or no, according to what you understand by religion." In these words he has described a heart-string that will never break. Does the new faith, however, satisfy the aspirations of the human heart as well as the old? The answer to this question is no longer doubtful. What consolation will æsthetic and literary tastes, or the worship of genius bring to a man in the hour of trial? How many outside the ranks of the "Upper Ten Thousand" could experience this comfort? But it is precisely by investigating the condition of the unbelieving masses that we learn how religious feeling must be deadened by distress and wretchedness, by education and bad example, before the creed of atheism can be promulgated. Then fanaticism, licentiousness, and hatred of religion usurp the throne of religion. The ideas that issue from the human heart are so foul and perverse that they undermine humanity as much as religion. As S. Augustine says:[10] "This

10. *In Joan, tract*, 106, 4 ad 17, 6. See Kleutgen, *Philosophie der Vorzeit*, 2nd Edit. Innsbruck, 1872, Vol. I., p. 347 seq. Fischer, *De Salute infidelium*, Essen, 1886, p. 24.

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is the power of the true Godhead that it cannot be wholly hidden from a rational creature who uses his reason. For, excepting a few whose natures are seething masses of corruption, all men confess God to be the maker of the world."

The term atheism, when applied to whole peoples like the Buddhists, has quite another meaning. Buddhists are not atheists in our sense of the word, although Buddhism began by denying the gods then in fashion. But the Godhead was driven from its sanctuary in the heart of man for a time only, and from a moral motive. The abstract notion of religion, indeed, is absent from Buddhism ; but Buddhism is a reflexion of older religious ideas that practically lead to religion.[11] Independent morality is even less competent to disprove the fact that religion is universal. In all the brighter periods of history the star of religion is in the ascendant ; in the dark epochs it is on the wane. There is no gainsaying the fact that culture and the moral regeneration of man are inseparable from the history of Christianity. There are men who, after rejecting Christianity, cause the blush of shame to start into the cheeks of believers by their minute observance of the natural law ; even they are influenced by the Christianity that has created modern civilization, and is still, consciously or unconsciously, at work in modern society. For the rest, comparisons do not go to the root of the matter. But it remains to be seen whether independent morality would be on a par with Christian morality, after quenching every spark of Christianity in a whole people. The phenomena of Nihilism and anarchy do not promise well for the success of the experiment.

11 Max Müller, Einleitung, p. 127.

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CHAPTER IV

RELIGION AND MAN.

Religion is co-extensive with man. Where man is, there is Religion. Religion and man vanish together from the scene. Religion being thus coeval with the human race, the difficulty of tracing it to its source becomes proportionately greater. Language and Religion carry us back to an age of which we know nothing. We can often learn the earliest formation of a language from its primitive roots, but such materials are seldom at hand for a history of Religion. Many of the old temples have disappeared, and the very names of many of the ancient gods are buried in oblivion. In journeying, then, towards the sources of Religion, the analogy of known religions is our only guide. But both Aryan and Semitic names of God date from historical times, when the human family was united,—before the great schism which shivered language into dialects, and parted men asunder in race. The origin of Religion lies further back than the known history of Religion.

Religion has an external and an internal side. It manifests itself in symbolism, art, and mythology, in culture and in life; but its home is in the ideas, thoughts, and feelings of man. Just as body and soul unite to form man, so all these elements are necessary ingredients in the one idea. As the soul's activity is dependent on the senses, and finds an outlet in the bodily organs, so the idea of Religion necessarily finds expression in outward worship which, in its turn, is improved and refined by religious life. But man's nature is on the side of the senses, and thus outward motives and forms tend to disfigure

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or supplant the internal elements. This will serve to explain in part why the origin of Religion has been sought in external causes. Had we only the speculations of deists and *illuminati* on this point, we might without further ado pass on to the order of the day. But modern philosophers are not quite so clumsy. They profess to explain by external causes, not so much the origin as the formation of Religion, but they generally arrive at the same conclusions, though in a roundabout way. Again, external causes are of two kinds, according as they lie in man's pride, or in his relation to nature. The form and origin of religion are said to bear the impress of pride, ambition, and that lust of dominion which is ingrained in priests and lawgivers.

According to the Sophists, Religion was invented by some shrewd statesman. This theory was doubtless suggested by the close union between Religion and the State, and by the many abuses that were sheltered under the cloak of religion. Moses, Zoroaster, and Numa gave laws in the name of God; Solon, Lycurgus, and others made Religion the basis of social order. To deny the gods recognised by the State was deemed a crime against the State.[1] As far as history gives any clue, legislators and statesmen used existing Religions for their own ends. How, in any other supposition, could Religion have been held up as the motive of obedience to the laws? How could the ruler be said to hold the place of God, and to be Prince by the Grace of God, if God Himself were not worshipped as the Sovereign Lord? Then, again, religion is universal. Would *all* statesmen have hit upon this brilliant idea? Is it not more likely that Religion—that powerful connective which has linked men together in communities in firmer bonds than even nature herself—first made political society possible? It would, indeed, have been surpassing strange if all mankind had not only submitted to be enrolled in Religion, but had also conceived a love for it as an affair of

1 Max Müller.—*Introduction to the Comparative Science of Religion*, p. 131.

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the mind and heart. Men believed in God long before kings or "shepherds of men" had come into being. By propagating belief in God, Religion has welded together peoples and states, and laid a solid foundation for law and jurisprudence.

With the priesthood, however, the case seems otherwise. In ancient times, priests were often the tools of statesmen, and humoured the whims of tyrants, and at times even held the reins of power, but the antagonism between the two orders was never wholly effaced; and everywhere we can perceive a tendency to set Religion on a more exalted pedestal. Here, too, we are confronted by the same dilemma; priests did not manufacture Religion, but Religion created priests. Religion is a priest's *raison d'être*. As an exclusive caste they are a phenomenon of history; but Religion is older than history. The Brahmans, the most powerful caste of priests that ever existed, subjected the Hindus to a religious bondage without parallel in history, and in justifying themselves pleaded the authority of the Vedas, their canonical books, that is of Religion. If in the olden time when priests were not, the heads of families be accounted as priests, then it becomes still more perplexing to discover what external causes could have induced them to invent Religion. The idea of a Priest implies the need of mediation betwixt God and man; to this need priests minister, but they cannot have created it. In like manner if family life were the cause of Religion, family life must have existed both before religion and without it. Hitherto, however, no one has succeeded in proving that the family life of the most ancient peoples was devoid of religion. It has been already shown that the stories about savages living in herds without religion are fabulous. Anyhow the question put long ago by S. John Chrysostom[1] still remains unanswered: Why have animals, that are without religion, never adopted family life? As far as our knowledge goes, families cling to the Religion they have inherited, and practise the worship in vogue. The heart

[1] Homil 19, 1, *In Joannem*.

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is admirably adapted to keep alive the fire of Religion, and to test the power of faith. Nowadays many tribes have no priests, for the title can hardly be given to the Shamans. But even a caricature such as this discloses the religious needs of the human heart. Even the Shamans utilized the religious ideas already existing; they did not invent the principle.

Some authors steer a middle course by tracing Religion to a compact that priests and rulers struck with the people, or that the people agreed upon among themselves. Thus Religion would seem to have furthered the ambition and ministered to the wants of subjects and rulers alike. But the palpable absurdity of this theory is evident after a little reflection. Such a convention could last only so long as it was necessary. Ambition is too weak a plaster to cement divergent interests. Religion is too deeply rooted in the heart of man to have been created by agreement. No individual of himself, could ever have conceived a religious idea, unless it had been previously suggested to him; so it is futile to imagine religious ideas asserting, from within, their ascendancy over an entire people and all mankind. Religion could not have gained a commanding spiritual power over the whole human race if it had been merely an invented device, or the outcome of ambition.

At first blush, the theory that Religion has grown out of man's relation to nature, seems more plausible. Man is dependent on nature; the earth's products provide him with food and clothing; climate in many ways determines his character; the mighty forces of nature tell on his mental disposition. Now, unquestionably, the religious ideas of the ancients, and and the superstitious belief of many peoples, to all appearances, depend on these conditions. The great contrasts between the two lands of Irania and Turania may have contributed largely to the dualism in the Iranian religion. Perhaps the plains of the Ganges favoured quiet meditation and mysticism, and the Arabian deserts invited to contemplation. Mohammed's Religion may have derived its warmth from the

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burning Arabian sun. Northern Religions bear a different stamp from those of the South. The Greek mythology recalls the genial climate of Greece. The founders of Religion are sons of the East, and are distributed within a comparatively narrow zone. But, be it noted, we are here dealing, not with the origin of Religion, but with a reformation; a new form of Religion. Even this latter is but loosely bound up with the physical conditions of the country. The three Monotheistic Religions took their rise in the heart of the Semitic races; but, says Renan, the tendency to Monotheism was not exclusively an endowment of race. With Phœnicians, Chaldæans, and Assyrians the case is different. Endowments of race and physical conditions are but the preliminaries, not the causes of Religion.[3] Christianity sprang from a particular Religion, and yet it was established and propagated as a universal Religion.

Still less satisfactory is the hypothesis that Religion originated in intense dread of the dangers to which life is liable from local and atmospheric conditions. No one denies that the mighty forces of nature strike terror into man and beast. What is more obvious than that dread of an unknown power makes man humble and submissive? Necessity, says the proverb, is the mother of invention. Hence, since the days of Lucretius and Petronius, it has often been alleged that fear is the cause and basis of Religion. But the fear of the Lord, not the fear of danger, is the beginning of wisdom. If man recognises the action of a supernatural power in things harmful and useful, the idea of the supernatural must, consciously or unconsciously, be already present to his mind, or he could in no way apprehend it. Anyhow there must be in the soul of man a lurking suspicion that he is dependent on some superior and invisible power. The phenomena of nature only prove forcibly that it exists. This feeling of dependence, so essential to the notion of Religion, is strengthened indeed, but not in the first instance pro-

Max Müller *Essays*, vol I, page 336; Vol II., p. 426. Lotze *Microcosmus* II., p 337, 3rd edition.

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duced by man's experience of his own helplessness in presence of the powers of nature. When noxious or dangerous influences gain the upper hand, they have a more enduring effect, and the fear of the natural mau swells in proportion. Is it then surprising that fear should be the first and, in some races, the only religious feeling? The desire to aid and protect self against evil influences naturally follows. In this way a belief in good and evil spirits may easily arise. But it can arise only where their pre-exists a belief in supernatural beings able to influence the life of man. With more probability we may say with Kant that man was forced to worship great invisible beings by a fear based on the knowledge of his own impotence. Thus fear would be the occasion; nevertheless to it must be joined the dread of the unknown and invisible, of the mighty and inaccessible*. Such a dread cannot be purely subjective; it must have some foundation in fact. The man of faith never ceases to fear the Infinite and the Holy.

The feeling of dependence and belief in God must have come from a primitive revelation. Man, whose whole being reposes in God, who is indebted to God for existence, has a conscious feeling of being dependent on God, his Lord and Creator. "All men stand in need of the Gods." Man is so fashioned that on every side he feels dependent on something outside himself. In every human breast the words of the Psalmist find an echo: "He has made us, not we ourselves." This is man's first glimpse and sense of the divinity—that *sensus communis* without which all Religion is impossible.

Without some psychological cause and foundation Religion, both in its beginning and its development, is inconceivable. The cause and the foundation of all religious ideas, from the lowest and most material to the most spiritual and sublime, is the human soul and its powers. Religious ideas vary because they are reflex ideas of the visible world, which vary according

* Happel.

4 Bleek, *Vergleichung der südafricanischen Sprachen* 1862. See Max Müller *Introduction*, &c., p. 49

to mental capacity and the dispositions of the heart. But their origin lies elsewhere. Between God and the soul of man, between Creator and creature there exists a natural affinity. Supernatural revelation, taking this affinity for granted, completes and elevates it. Without some such primitive natural revelation there is no transition from the phenomena of nature to the idea of God. The idea of God is indeed connected with natural phenomena, but it did not exclusively originate therewith. The wonderful powers of nature were inexplicable to man without the operation of superior beings; but for that reason not the natural bodies, but he to whom they belong was adored. The idea of God preceded the deification of nature. Light and darkness are symbols of joy and fear; but the supreme God of the Aryans is Dyaus, Zeus, Jupiter, Tyr, the illuminator, brightness*.

May not the ideas of the supernatural and the spiritual be more successfully explained by *Reverence*, which is a nobler passion than fear? Reverence is shown chiefly to the distinguished members of the family or tribe. Owing to the general belief in the immortality of the soul it reaches even beyond the grave, because a mysterious intercourse is thought to exist between the two worlds. This reverence, coupled with fear, first finds expression at the funeral solemnities, at the funeral banquet, or at the funeral sacrifices. May not religion, then, have been gradually evolved from ancestor-worship? Worship of ancestors may have had a large share in shaping the formation of Religion; but it still leaves the origin of Religion unexplained. Religion nowhere consists in mere ancestor-worship. Heroes are deified, but they are not gods. Beloved relatives are gathered to their fathers; but they do not constitute the whole of the kingdom of the next world. Even the crudest religions exhibit some traces of a belief in a supernatural being who is above all men and also above the spirits

* In the foregoing remarks the author uses language that might easily be interpreted as that of an advocate of an *inborn idea*. But such is not necessarily the meaning and force of the words. (Tr.)

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of the departed. But, with savagery on the increase, the tendency would be to supplant the worship of the gods by ancestor-worship. From this cause many tribes, *e.g.*, Kafirs, Negroes, and Polynesians have been classed as having no Religion.[5] But even here the religious basis is discernible. Ancestors were substituted for gods because they were thought to have greater power. For if Reverence be the main cause of the worship of ancestors lately departed, the sense of relationship will grow familiar the further the ancestral line recedes into the dim past, till all distinction is lost and those at the end of the series are identified with divinity. From being conscious of a relative dependence on ancestors, man gradually became conscious of a tribal dependence on the supreme head of the tribe—the eternal god. Worship of ancestors did not originate in dreams, as Darwin supposes; nor again was worship of the gods begotten of ancestor-worship; for both pre-suppose objective beings. And was not the sight of the havoc wrought by death throughout the kingdom of nature calculated to destroy the idea that ancestors continued to live and hold the reins of power after death?

From this there is but a short step to the *idealistic* theory of Religion, in support of which two spiritual forces are brought into requisition. Buckle stands sponsor for the imagination, and Peschel for the understanding. Unbridled fancy is most ill-suited for such a work. How can an idea that meets the wants and satisfies the aspirations of the hearts of all men be the creation of the freaks of the imagination? Knowledge must give place to scepticism if the grandest ideas and the noblest and mightiest affections have arisen or can possibly arise from the whims of a diseased imagination. But with a widespread Shamanism staring us in the face we may with sincerity echo the lament of Peschel:—" Amid incessant aberrations of the

5 Odyssey III., 45. Max Müller, *Lectures on the Science of Language*. Vol. II., p. 405. Schelling gives the psychological explanation in his introduction to the *Philosophy of Mythology*. Delff, *Grundzüge der Entwicklungsgeschichte der Religion*. Leipzig, 1883.

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intellect we are well nigh overwhelmed by the melancholy thought that the human mind is a machine which can act in only one way when the motives acting upon it are similar.'"[6] But Shamanism has reference to the form of Religion, not to Religion itself. A grain of truth is imbedded in Shamanism. It should be borne in mind that moral shortcomings as well as the intellect are responsible for these aberrations.

Here, again, it is fair to ask: Why do mankind generally transform the products of fancy into objective realities in religious matters only? Why are not the castles they build in the air made to undergo the same process? And should not their experience of castle-building have had the effect of guarding them against investing religious ideas with the garb of reality? If, in daily life, as men grow older, they shelve the fancies of childhood, and test the dreams of youth by the mature judgments of age, why should not the life of humanity run on the same lines? Otherwise Religion must retire before the advance of science. History demonstrates, however, that it is precisely the Religions of civilized peoples which are the most perfect. As a rule the decline of Religion has been accompanied by a moral decadence and a declining civilization. Now turn the question round: Should we not expect fancy to be most prolific in children and in the infirm? If, as Herbert Spencer maintains, Religion was generated by the dreams of the savage and his reflections on his own shadow, it must of necessity lose all hold on the educated. In a dream, it is true, the soul is in a manner separated from the body and can roam at large over the universe; but when a man wakes he knows that it was a dream and nothing more. Reflexion on his own shadow will not make a savage think of a being without a shadow any more than imagining a well-loaded table will appease the cravings of hunger.

6 See S. Thomas, *Summ. Theol.*, I., p. 12, a, 1. Peschel, p. 278. Tiele, *Compendium der Religions—Wissenschaft*, p. 19 (Weber's translation). Lippert, *Die Religion der europaischen Culturvölker*, 1881, p. 414.

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The mind of man is wholly under the dominion of the principle of causality. Philosophy, according to Plato, begins in wonder. The philosophic meditations of every child begin in wonder. "There is," says S. Thomas, "in the nature of man a desire to know the cause of the effects that he sees; in this way the sense of wonder arises." The Whither and the Whence, the Why and the Wherefore are questions that persistently press the mind for solution. But it is easier to ask these questions than to answer them. All things cannot be successfully traced to their causes. Hence the ordinary mind is disposed to invent causes arbitrarily. Setting out from its own self-consciousness the mind arrives, as it were by unconscious steps, at the conclusion that phenomena are caused by a superior spiritual being. It even brings itself to look upon natural objects without life, *e.g.* stones, earth and water, as endowed with a soul; in the life of nature and the wondrous movements of the heavenly bodies it recognizes the agency of a powerful spirit. The need of causality works at first instinctively in the mind; then it flies boldly forward, ever ascending higher and higher till at length it soars up to the highest cause. "If," says S. Thomas, "the understanding of a rational creature cannot reach at the first cause of things, the desire of its nature will remain unsatisfied." A vague longing for reasons, an effort to transcend human experience, and an instinctive impulse to explain the visible by the invisible are one of the chief sources of mythology. The oldest parts of the Rigveda and Zendavesta are taken up with numerous questions on the Whence and the Whither.[7] According to Hegel and Schopenhauer, the chief cause of Religion is a yearning for metaphysics; Religion being, in their view, only popular and allegorical metaphysics. And Liebmann concludes there must be faith, as knowledge is impossible.

It cannot be denied that there is some force in considerations of this kind. S. Thomas has been quoted of set pur-

7 Max Müller, l. c. p. 386; *Essays*, vol. I., p. 27, 219. Gloatz I., p. 187.

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pose, because the proofs for the existence of God will afford an opportunity of enquiring more searchingly why the schoolmen laid such great stress on the law of causality. But it is already clear that the inferences drawn from causality are wider than the premisses warrant. How could the principle of causality alone, apart from all idea of the supernatural and the Divine, enable man to attain this solution of the world's enigma? Unless man first believed in his own soul, he could not think that natural objects have souls; the world would not appear to him to be the work of God unless he regarded spirit as superior to matter. To such heights of abstract thought uncivilized people could never have climbed; civilized peoples must have perceived that it was a pure abstraction and rejected it accordingly. Neither does this theory square with the childhood of the human race; for the writings of civilized nations make it quite certain that Religion nowhere began with the deification of nature. Mythology is not a beginning but a deviation from religion, the sources of which are not at present thoroughly explored. A crushing refutation of this theory is found in the fact that the Religion of a people grows in refinement in proportion as it advances in civilization. Even the most rigid science, culminating in a general scrutiny of causes, has not succeeded in rendering Religion superfluous. Science, in its progress, has dashed to the ground the poetic conception of nature; mythology lies like a prostrate Dagon before it; but the only answer itself vouchsafes to the most momentous problems is that the answer is unknowable. The master-minds of all ages have sought the causes of things,—and believed. Neither telescope, microscope, nor spectroscope, neither chemical analysis nor experimental physics will ever wholly satisfy the desire, ingrained in man's nature, to know the cause. Reason, however enlightened it may be, cannot unravel the riddle of the universe without the aid of faith. Belief in God, the Creator and ruler of the universe, gives a fresh spurt to science, and stimulates it to deeper enquiries. Copernicus boasted that his system tallied with

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the Divine wisdom better than the fanciful artistic theories and complicated constructions that had gone before, because it exhibited harmony and order prevailing in the universe. Should science succeed in reducing all the forces of nature to one single fundamental force it will proclaim in a more beautiful manner the wisdom of the Creator, which has made this magnificent world from such insignificant materials. But it must be insisted that enquiry has its limits.

> Seek not the wherefore, race of human kind ;
> Could ye have seen the whole, no need had been
> For Mary to bring forth.[8]

The foregoing solution of the problem labours also under another disadvantage. It is merely intellectual, and leaves wholly out of sight the important factor of moral consciousness. Fear may perhaps have a supernatural origin, still it can only explain the distinction between the useful and the harmful ; but it is not a whit less imperative to fathom the distinction between good and evil, which is as universal as the law of causality. The moral strivings of the whole human race, and its longing for the good, the perfect and the infinite cannot possibly have for their groundwork an intellectual fiction. Self-denial and the renunciation of the world, heroism and martyrdom require stronger motives than a mental illusion ; otherwise morality and civilization, character and culture would always keep pace one with the other and blend in equal proportions. But who would maintain such a proposition as this ? And, what is more to the point, who would undertake to prove it ? God has chosen the weak and foolish that He may confound the strong and the wise.

Religion, then, is a *spiritual force and disposition* inherent in all men, and not only independent of sense and intellect but, by its very nature, sharply antagonistic to both. If this disposition were stamped out of the soul, idolatry, even in its most degraded form, would be impossible. All

8 Dante, Purgatorio, iii., 35-37. Cary's Translation.

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Religions strike a chord in the soul which is in unison with the soul's effort to conceive the inconceivable and to utter the unspeakable ; it matters not whether this effort be denominated a morbid curiosity about the absolute, or a yearning for the Infinite, or the Love of God.[9]

The chief element of Religion consists in the idea that a moral order pervades the universe. Faith itself is an act of the will, and moral obedience a victory of man over nature. The tendency of the finite to develop and unite itself to the infinite is not enough to constitute Religion, unless it be joined to the consciousness of man's own littleness and infirmity. Thus, the consciousness of *sin* and the desire of forgiveness will necessarily be awakened. The existence of sin and evil, the desire to account for their existence, and if possible, to obliterate them are, as Hartmann observes, at the bottom of all Religions. The consciousness of sin is founded on conscience, that is, the struggle between the outward and the inward man. Morality and conscience are the weak points in the unbeliever's armour ; here he can be safely attacked.* This is the rock on which all idealistic theories are wrecked. If religion be regarded as a compromise between the feeling of dependence on the world and the desire for liberty on the one hand, and the consciousness of dependence on God and independence of the world on the other, then either Religion is being already taken for granted, or we are wandering in the maze of a mere mental process, inasmuch as we become conscious of the contradiction that exists between spirit and matter, and thus feel constrained to seek a refuge from the struggle in Religion. But then the idea of morality and the general character of Religion are still unexplained. The truth of Christ makes those free who are not of this world ; but this truth is not a product of human thought, but a power from above.

9 Max Müller, *Einleitung*, p. 15 ; *Essays*, Vol. 1, p. *xxviii*, and 218. Liebmann, *Analysis der Wirklichkeit*. Strassburg, 1880, p. 614. Steude, *Ein Problem der allgemeinen Religions—Wissenschaft*, Leipzig, 1881, p. 62. Gutberlet l. c p. 98.

* Vosen, Steude.

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The back of the latest idealistic theory, if so it can be called, I mean the theory of evolution in natural and religious history, is broken by what has already been said. The evolution hypothesis professes to explain the general character of Religion in the same way as it explains the intellectual and moral elements. It asserts that Religion has been built up from that same animal instinct which is the stepping-stone to thought and volition. Hence this solution would seem to embody all the internal elements of the previous solutions, and to explain both the origin and the development of Religion by the mutual co-operation of external causes and the internal life of man. It would open out a perspective through the whole doctrine of descent into the vast field of the comparative science of Religion, accounting for the gradual beginning of Religion by the former, and its progressive development by the latter. Both assume that general barbarism was the first stage in the history of the human race, and that man has gradually developed from a condition resembling that of the brute. Such is the line of thought followed by Spencer, Tiele, Seidel, Lippert, and many others, who maintain that Religion has a natural origin. Their systems will be examined in detail later on. Here we can merely give an outline of the chief points that tell in favour of Religion.

First of all, it must be borne in mind that Religion exists among all races of men, even the lowest, and that it is not found in any class of animals, even the highest. Nor is this all. Exalted ideas of Religion and morality are discovered at times even among the most degraded peoples. We have already cited the Africans as an instance in point. Comparatively speaking, the same is also true of the Indians. Existing theories on the ideas of man in his primitive state have been substantially modified by recent researches among the Papuans. The curious and wonderful carvings of New Ireland not only exhibit the artistic sense of that people, but are also a manifestation of the entire range of their mental activity. There is a richness of ideas such as the most civilized races of the two hemi-

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spheres, Egyptians, Assyrians, and Mayas have fully matured.[10] The inhabitants of the Solomon Islands are said to show great taste and astonishing ability. The Papuan conception of God is said to attain its zenith among the Fiji Islanders ; even in its cosmogony it is far superior to the crude worship of the God of Heaven that obtains with most African savages. The graduated scale devised by Lubbock, viz., atheism, idolatry, anthropomorphism, creator, has proved untenable.

The Positivists are equally inaccurate in making all Religion begin with Fetichism. From the beginning Fetichism (*Portuguese* Feitiço, to charm) has been undefinable. It must rest on historical and psychological antecedents. No Religion is wholly devoid of Fetichism ; no Religion is wholly composed of it. Both are founded on the nature of man. For man, being a creature of sense, desires to have a symbol of the spirit that transcends matter, a God present in visible form. As a created being man is, of course, but too much inclined to confound the creature with the Creator. Nevertheless both artistic and natural Fetichism pre-suppose a higher spiritual being, a creator. Setting out from what is most perfect we transfer some of its qualities to the finite. Man ascribes to God the form of man, and attributes a humanized divinity to nature. Consequently Religion is not man's impress on matter, but the triumphant reaction of the soul on things which it makes participate in its own nature. *Animism* joined to Fetichism does not, as Tiele contends, explain the origin but the decline of Religion. The more man loses the idea of an absolute spirit, the more he feels the necessity of endowing nature with spirits and devising means of intercourse with them. But to do this belief in spirits must previously exist. Worship of ancestors is little to the purpose in explaining this belief. The widespread idea that Fetichism is universal is erroneous. This theory has itself

10 Bastian, *Die Inselgruppen in Oceanien*. Berlin, 1883, p. 4 and p. 161, 820. *Die heilige Sage der Polynesier*. Berlin, 1881, p. 76. Gloatz, p. 944 and 1008. Nadaillac, p 235. Schneider II., p. 355.

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become "a sort of scientific Fetichism, which, like most fetiches, owes its existence to ignorance and superstition." [11]

The lower the figure at which man's original condition is appraised, the more difficult grows the task of explaining the history and development of religion. Hitherto no one but Munchausen has succeeded in lugging himself out of a bag by his own hair. Now history pictures man as civilized from the very beginning. Modern ethnography has even made it probable that the civilization of Asia and America was far more extensive than has been supposed. In the middle of the seventh century, A.D., a Chinese Buddhist undertook a journey through Central Asia to India, in order to study Buddhism at its source. He wrote an account of his travels in the *Pilgrim's Book*, from which it is clear that the races of Central Asia were at that time in an advanced state of civilization. The Tartar hordes, at whose name the modern world shudders, were not barbarians, but well skilled in the chief arts and institutions of civilized society.[12] Whether we consult the Bible or the ancient documents of the East, we find the tribes everywhere represented as being already in possession of a civilization and a developed form of religion.

The comparative science of Religion has done good service by shewing that the fundamental elements of religion were common to all ancient civilized races. If we trace back to the earliest period the three forms of religion, the Aryan, the Semitic, and the Turanian, we find a common root for religion; but the primitive man without religion, the "*homo alalus*," speechless man, the man who is half an animal, is nowhere to be found. The divinities that are the most ancient are likewise the most spiritual. Nor is the force of this argument weakened by the evolutionists' contention that civilization is the work, not of one people, but of the whole human race.[13] True, all the ages and

11 Max Müller, *Origin and development of Religion*, 1881, p. 89. *Controverse* (1886), p. 171. Schneider II, p. 273.

12 Max Müller, *Essays*, vol. I., p. 246.

13 Schaffhausen, *Anthropologische Studien*. Bonn. 1885, p. 99, 418 seq.

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peoples that had the natural conditions for such development, have worked to this common end, but the foundation must have been already laid, the means already to hand. Neither natural forces working harmoniously together in space and time, nor the struggles of animals to feed and propagate themselves have ever produced a higher civilization or a superior force in nature. What is lowly can be ennobled only by something above itself,—and then only if the necessary conditions are present. Who would have separated the first man from the animal world? Here we are content to pass over the further question as to the progress or decline of religious development. That it was not gradual is evinced by the history of Christianity. Christianity arrayed itself in opposition to Judaism and heathenism, promulgated a new doctrine and new commandments, and thereby set society on a new basis, and renewed the face of the earth. To try to explain the irresistible onward march of Christianity by natural development would be labour lost.

Perhaps it will be insisted that the *scientific* hypotheses of evolutionists are better than their history. What then are the religious instincts of animals? Evolutionists tell us of love, gratitude, attachment, and so forth. Now a great deal in these hypotheses may be safely relegated to the domain of anecdote or fable: still, a grain of truth remains. The question may be studied from two points of view: the relation of animals to one another and to man. Animals are frequently said to show parental, filial, and conjugal love. Nor is the tendency of many to sociability to be denied. But the idea of Religion is still a long way off. A deal of sentimentality is required to perceive human feelings in animals. These instincts serve one purpose and one only, viz., preservation of self and of the race. Once this purpose is fulfilled the instinct comes to a standstill. Conjugal love lasts as long as the breeding season; the love of parents ceases with the maintenance of their young. As soon as the young can feed themselves, all intercourse between parents and their offspring

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is at an end. There is not the faintest trace of offspring supporting their parents, or showing them reverence. The social instinct, or the tendency to congregate, is most highly developed in certain kinds of insects. But can the republic of bees be in any way compared with even the most primitive society or state of man? Here are nature and instinct, and nothing besides. Without education or training each member of the hive performs the task allotted to it, and the function adapted to its organism. Man must be unduly degraded, and the brute unduly exalted, before troops of monkeys can be put on the same level with supposed hordes of savages. But even then Religion cannot be derived from the social instinct. Again, the dog's attachment to its master, its gratitude which can go so far as voluntarily to endure death from hunger, how different from even the negroes' fetichism! We look in vain for the essential constituent of Religion,—the idea of the supernatural. If Religion were merely the feeling of dependence, its analogy might be found in the dog; but dependence is only one element in the idea, and is itself the effect and consequence of the relation existing between man and God, between Creator and creature. For Religion is not a feeling of sense, but a reflex feeling, the expression of spiritual experience. The animal does not rise above sense. It is constant training alone that produces the feeling of dependency. An animal never arrives at abstraction, or a judgment of universal relations; the dog never regards its master as its God. An animal, then, has no Religion, and no basis for Religion, otherwise we should long ago have caught a glimpse of it in the higher animals, *e.g.*, the dog or the ape. No sign of what we mean by worship has been discovered in animals, although the most degraded tribes are never without it, at least in a rude form. Prayer, that involuntary expression of religious feeling, is wholly wanting in the animal kingdom. Of prayer for the dead, of a presentiment of existence after death, not a trace is to be found.

Man's Religion, then, is neither the outcome of an his-

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torical development of the human race, nor the product of a gradual refinement of instinct. The able rationalistic scholar, Maurice Vernes, has rightly said : To speak of the evolution and growth of Religion is hazardous ; but to presume to throw light on its origin is insufferable. Men are not yet agreed as to the nature of the Vedastic, Buddhistic and Egyptian Religions ; yet they pretend to know the origin of Religion itself. The genealogical classification of Religions—a gently sloping ladder too artificially constructed—is illusory, and the existence of primitive types a deception. An objective reason in man himself, that is a specific disposition of human nature, must be assumed. Scientists may, if they please, follow Dahl in calling this human instinct. There is no need to quarrel about names. Anyhow this instinct, if so it be called, is the greatest gift God has bestowed on Man.[14] Without this divine gift Religion is inexplicable and the history of mankind an enigma. Two elements go to make it up ; a subjective disposition and an objective fact. It is as irrational to describe Religion simply as a deceit and an error of many years' standing, as to seek its origin in the ordinary endowments of the mind. Religion is intelligible only if it have for its foundation a special objective Being governing all his thoughts and actions, to Whom man is involuntarily drawn and Who has revealed himself mediately and immediately to him. Religion presupposes a natural foundation and disposition, but is not merely evolved therefrom. The Religion that generally goes by the name of "Natural Religion" does not exist in history. It is an abstraction of enlightened Deism, a gloomy theory of shallow Rationalism which has drained Religion of truth and life ; or it is a postulate of evolutionists who admit

14 Dahl, *Nothwendigkeit der Religion*, *eine letzte Consequenez der darwinistischen Lehre*. Heidelberg, 1886, p. 100. J Fritz, *Aus antiker Weltanschauung*. *Die Entwicklung des jüdischen und griechischen Volkes zum Monotheismus nach den neuesten Forschungen*. Hagen, 1886, p. 1, seq., 162 M. Müller, *Essays*, p. xxviii. and 218. *Einleitung*, p. 115-118. Maurice Vernes, *Revue critique* (Sept. 1885). *Controverse* (Sept. and Oct. 1886)—Roth, *Zeitschrift der morgenl. Gesellschaft*, vol. vi. Teichmüller, *Religions—Philosophie*, Breslau, 1886.—(Psychological Explanation.)

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neither what is specifically human nor specifically divine. "Natural Religion" is in the first place a negation of supernatural Religion ; consequently a mere logical function or entity. The promoters and propagators, to say nothing of the founders of almost all Religions have appealed to revelation. The principles of natural Religion alone have never formed a real historical Religion. They only prove that supernatural Religion requires a natural basis in man himself. *Gratia supponit naturam.* The true Religion must be of greater value than this miserable remnant. Religion must be a light for the understanding and a power for the will. It must not only teach man to know God, but also to put himself in the right relation to God. Religion must interpose the grace and benignity of God between man and God, declare the conditions necessary for partaking of it, and give power to make grace efficacious. The union of man with God, the eternal happiness of man is the highest end of Religion. It is not merely a communication of supernatural truths ; nor pure morality, as Kant teaches ; nor the mere feeling of dependence as Schleiermacher contends ; but it embraces all the powers of man, and lays hold of man's powers and faculties in their utmost depths. Its aim is to lift man above what is earthly and sensible to what is eternal and divine.

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CHAPTER V.

TRADITIONALISM AND ONTOLOGISM.

Only the fool says: "There is no God."* "All men "are vain, in whom there is not the knowledge of "God: and who by these good things that are seen, "could not understand him that is, neither by attending to the works have acknowledged who was the "workman: But have imagined either the fire, or the "wind, or the swift air, or the circle of the stars, or "the great waters, or the sun and moon, to be the "gods that rule the world."†

"Because that which is known of God is manifest "in them. For God hath manifested it unto them. "For the invisible things of his from the creation of "the world are clearly seen, being understood by the "things that are made: His eternal power also and "divinity; so that they are inexcusable. Because "that, when they knew God, they have not glorified "him as God, or given thanks; but became vain in "their thoughts, and their foolish heart was darkened."‡

"Ye men of Athens, I perceive that in all things "you are too superstitious. For passing by and seeing your idols, I found an altar also on which was "written: *To the unknown God.* What therefore you "worship, without knowing it, that I preach to you. "God, who made the world and all things therein, "seeing He is Lord of Heaven and earth, dwelleth

* Ps. 52, 1.

† Wisdom xiii, 1 and 2.

‡ Romans I., 19, 20, 21. Compare I. Corinthians, i., 21.

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"not in temples, made with hands. . . . . And hath "made of one, all mankind, to dwell upon the whole "face of the earth, determining appointed times and "the limits of their habitation. That they should "seek God, if haply they may feel after him, or find "him, although he be not far from every one of us. "For in him we live and move and are."*

"We also are mortals, men like unto you, preaching "to you to be converted from these vain things to the "living God who made the heaven and the earth, and "the sea, and all things that are in them: Who in "times past suffered all nations to walk in their own "ways. Nevertheless he left not himself without testi-"mony, doing good from heaven, giving rains, and "fruitful seasons, filling our hearts with food and "gladness."†

"For when the Gentiles, who have not the law, do "by nature those things that are of the law; these "not having the law are a law to themselves; who "shew the work of the law written in their hearts, "their conscience bearing witness to them, and their "thoughts between themselves accusing, or also de-"fending one another."‡

"Blessed are the clean of heart, for they shall see "God."§

"For we are also his offspring."‖

Such is the language used by the sacred writers in combating the intellectual and moral errors of the heathen. These words of Holy Scripture show that the human mind, by meditating on the creation and government of the world, was in a position to recognize God as the author of all things, and the loving father of men. The voice of conscience, too, should have revealed the source of all good, and have brought home the truth that there exists

* Acts xvii., 22, seq.
† Acts xiv., 14-16.
‡ Romans ii., 14-15.
§ Matthew v., 8.
‖ Acts xvii., 28.

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one who will judge the conduct of men, who has written his law on their hearts, and who by His power sustains and is present in each one. Thus the natural knowledge of God is declared to comprise an *inward* and an *outward* element. It goes without saying that reason is its principle; but the inner element goes hand in hand with external experience. Side by side with the visible creation there is the invisible world of the human heart which is described as a book written by God, wherein man can decipher God's Holy Name. And here another remark suggests itself, which is not without its significance. The sacred writers distinctly lay down the principle that God can be known from nature, and that therefore the heathen are without excuse. But their purpose is not so much to establish faith in God, as to contrast the true knowledge of God with false belief, to weigh the one true God in the balance against imaginary self-made gods. The heathen believes in a superior being. Even the fool has only his own denial to offer in exchange. He is a fool, both intellectually and morally. The sacred writers fasten on the truth underlying all error, in order to lay bare the error in all its hideous deformity and to show its moral culpability. Time was, when the command was unnecessary: Thou shalt believe in one only God; Thou shalt have no other gods beside Me. Originally faith found its natural expression in that most simple proposition; God is God. The wording did not run: There is one God. The very idea of other gods would be an error which, however, proves the necessity of religion. But the contemplation of nature and the voice of conscience furnish abundant means for detecting the error. And we know from history that there is scarcely any religion but contains some truth,—quite enough to enable those who seek God to find Him in the hour of need.

Philo, the Fathers, and many apologists, including Leibnitz, who walked in their footsteps, traced all that was true in heathen philosophy and religion to the Old Testament. Doubtless their defective knowledge of religious

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history drove them to fabricate this theory. They were right, however, in rejecting its autochthonous origin. In this the history of religion bears them out. For not only does it exhibit an ever-increasing tendency to make all known religions radiate from a common centre, but it is equally impotent to give a satisfactory account of their origin. Mythology presupposes a reasonable religion, just as a sickly body presupposes a healthy one. An idea of the godhead must have been present to the minds of the Greeks before they worshipped the heavens, and the sun and moon as gods. For how could they speak of a plurality of gods, unless they first had some notion of the general attributes that belong to divinity? If only the "universal primitive religion which God gave direct to man" be looked upon as completing the religious disposition originally implanted in man, and not as a ready-made system, this explanation will no longer seem out of place in the history of religion.[1] It places the religious basis in man's own nature on a sure footing. To assume, however, a fertilizing element outside the human mind is not to believe in a being who "paints the lily," but to confess that the same God who laid the religious foundation in the heart had previously revealed Himself in creation. As a matter of fact, all religions trace their origin to a revelation. Enough of the original revelation remained to enable enfeebled reason to know God in some measure from creation; but it was not proof against error. Holy Scripture does not picture Almighty God as waiting to see whether man would develop his powers of speech and rational cognition, and how he would use them, but, we are told, God and man forthwith conversed. Whatever be the interpretation put on this naive and childlike narrative, one thing at all events is clear; that man underwent a course of training similar to that by which children are influenced by their parents, and pupils by their teachers. The traditional element enters strongly into all education,

1 Max Müller, *Wissenschaft der Sprache*, vol. II., p. 387. *Einleitung in die vergl. Rel-Wiss.* p. 124.

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as far as we know, without exception. Since, therefore, the first man was perfect in body, he had, of necessity, the use of reason and speech.[2] It still remains to be proved that man, if left to himself, would by degrees have invented language and attained to the knowledge of religion.

S. Thomas opens his treatise on God with two preliminary questions: Whether God is known *in se*, and whether the existence of God is capable of proof. He takes for granted the notion of God, and explains it as a confused universal notion founded on the natural desire of happiness. To the question why truths that can be discovered by reason are also proposed to our belief, he makes answer that, were it otherwise, the knowledge of God would be the exclusive property of a few highly gifted men, whom the attainment of it would cost years of patient toil; and even at last they would have no security against error.[3] Hence faith is necessary to make man absolutely certain of divine truth. But that all men may arrive at the knowledge of God by an easy route and without danger of being led astray, God, in His goodness, has commanded us to believe even what can be known by unaided reason. Before the law was written, faith in God, who had promised Himself to their fathers for an inheritance, was kept alive by the patriarchs. Neither have the heathen lost all traces of this inheritance. The vestiges of it would have been still more distinct, if the moral depravity of the heathen had not darkened their reason and rendered it powerless against the assaults of error. There is no lack of learned men of late, Moigno and Secchi for instance, who hold that, without the aid of a previous revelation, man would never have been able to grapple with the fundamental problems of the universe. To us nothing seems simpler than to conceive the earth as a globe moving in space and turning on its own axis. Yet what childish ideas the ancients had formed about the shape and position of the

2 Kleutgen, *Philos.* vol. I., p. 74.

3 *Summa Theol.* I., q. 1, a. 1; q. 2, a. 1.—*Contra Gent.* I., c. 4.—Kleutgen *Philos.* II., p. 21, seq. Secchi, *Schöpfung*, Vol. 1, p. 3.

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earth, and about its motion and rest! Secchi is unwilling to give human insight and industry credit for our superior knowledge. In his view, this great idea was but a faint echo of that wondrous knowledge which had been bestowed so bountifully on the first man, and which, in course of time, he handed down to his posterity. The heathen had lost sight of this truth. It was preserved only in the traditions of the chosen people, and locked up in a language to which few had the key. But modern science has again revealed it. We will not discuss whether this be not an exaggerated estimate of the first man's knowledge of natural science; but its importance for the knowledge of God is the more emphatic. He who will come to God must first believe that He is. The vast majority of men first come to the knowledge of God by faith. At this stage they remain, never advancing a single pace beyond. With all men, faith is a business of the heart. Faith embraces the whole man, particularly the will. For the believer proofs have the value of a reflex analysis, by which he is enabled to assure himself of the truth of faith and to make chaff and corn fly asunder, that is to separate the true faith from the false. Even those savages, whose eyes, though dimmed with death's dark veil, suspect the presence of a higher cause in every nook and cranny of nature, have perfect faith only after hearing the gospel preached. But the savage without religion is a nonentity.

The Vatican Council teaches that man can know for certain that God is the beginning and end of all things, if only he let the natural light of his reason shine on created things. This notwithstanding, God has been pleased to reveal Himself and His eternal decrees to man in a supernatural manner. Thanks to this divine revelation all men, even in the present condition of the human race, are in a position to know with perfect certainty and without any admixture of error divine truths that do not lie outside the domain of reason. Revelation, however, is said to be *absolutely* necessary, because God, in His goodness, has destined man for a supernatural end. But revelation is

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also *relatively* or *morally* necessary for man if he is to know even the truths of natural religion. Then again this natural knowledge, the acquisition of which is said to be within man's reach, supposes the reason to be well-developed—to such an extent, at least, that man can actually use it. The Council does not define what conditions are necessary in order that the development may be considered adequate. Only the rankest *Traditionalism* is outlawed, which assumes that the use of reason involved in arriving at the knowledge of God can be brought into play by nothing save a positive revelation from God, immediate or traditional.[4] For supernatural revelation would thus be made absolutely necessary.

In order to parry the thrusts of Rationalists and Pantheists, certain French philosophers and theologians, including the names of de Lamennais, de Bonald, Bautain, Ballanche, Bonnetty, Leroux, and Reynaud, erected faith into the sole principle of knowledge. The universal and unbroken tradition, which is the object of faith, was thus made the source of all knowledge generally, and of religious knowledge in particular. A primitive revelation was assumed to be the necessary forerunner of the whole spiritual and religious life. Some derived their knowledge of this primitive revelation from universal reason, others from tradition. The former were carried down the stream, and drawn into the rationalistic whirlpool; the latter drifted into supernaturalism. Lamennais's philosophy starts with the idea of being—not the absolute being, but the idea of being which is the highest idea of reason. But as he proceeds he confuses one with the other, and treats the idea of God as the first idea, and as the indispensable condition and fount of all knowledge. In distinguishing between the logical entity, the pure ideal entity, and the entity of general metaphysics or the objective reality, he steers his course smoothly; but he flounders as helplessly as Hegel when he discourses on the universal

4 Session III., chap. 2, *De Revelatione*. Martin, *Die Arbeiten des Vaticanischen Concils*. Paderborn, 1875, p. 16, seq.

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indefinite entity which reason apprehends in things, and the transcendental infinite being who is the source whence all being flows. The universality of ideas, particularly of the idea of God, is likewise de Bonald's starting-point. But he traces it back, in its source, to an immediate revelation from God, with language as the medium of communication; and he considers Tradition to be the only means of acquiring it. In like manner Bautain appraised the reason both of individuals and of the human race generally at a very low figure. He, too, was content to take divine revelation as the source and test of all truth. Tradition, of course, is a legitimate factor in the process of cognition; but by brandishing it as the sole principle and source of knowledge, another equally important factor is ousted, viz., the truth of reason, and the natural capacity of reason for truth. Thus the process of cognition is confounded with the object of cognition, Logic with Ontology.

It may be regarded as certain that no intellectual devel opment is possible, unless there be a propelling force from without. But, does it thence follow that the mind is nought but a barren waste? and that all its ideas are imported? Unless a plant be provided with moisture and nourishment, unless light and warmth play upon it, its blossom will be blasted in the bud. But who will say that its life and growth are therefore owing to these external conditions? In like manner, the human mind needs props and stimulants; but before receiving these impressions it is already the human mind. The sum of its knowledge, too, exceeds in quantity and quality the sum of their products. The reactions of the human mind are far from identical with sensible impressions. The universal ideas with which it enriches itself differ so essentially from the harvest yielded solely by the sense-perceptions of particular things, that they must necessarily originate in an independent capacity of the human mind for thought. Withdraw this capacity, and straightway progress and knowledge (religious knowledge most of all) are buried in the abyss. We have all certainly inherited a rich stock of

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spiritual possessions. We have inherited language from the Aryans, writing from the Hamites (Egyptians), the divisions of time from the Babylonians, figures from the Arabians, classical culture from the Greeks and Romans, Christianity from the Church, and religious training from Theology. All this we take as a matter of course without reflecting what gigantic efforts it cost our forefathers to acquire these intellectual treasures. But to enter upon this inheritance we must make it our own. If it is to bear fruit we must repeat the process of thought of many thousand years. Had thoughts and ideas been transmitted by language we should not have to learn them anew with language. How could man even drink down the ideas transmitted by language unless he had been endowed with an inner capacity for the purpose? Again, if Tradition were the one source of knowledge the contents of Tradition would be emptied into all men in the same way. But man is free to choose one word and reject another; he has power to refine and reform his language by degrees. We have only to read the history of language to see the many changes through which it has passed. Traditionalism and Positivism are very much alike. Both aver that man's intellectual activity is of no avail. Traditionalism refers all things to Tradition, Positivism to sense-perceptions. The two extremes stand in polar antithesis to Rationalism, but play into its hands. As soon as Traditionalism clearly defines its ideas, it merges into Rationalism; and on this ground it shakes hands with its antipodes, Ontologism. It is a cardinal tenet of Ontologism also that all certain knowledge comes from supernatural faith. It sees all things in the idea of God; from this idea it derives all other ideas. Ontologists[5] agree with Traditionalists that the soul has no power of generating ideas, or of knowing things by means of ideas created with it; but it sees all things in God. The idea of God lights up our

5 Malebranche, Thomassin, Gioberti, Mamiani, Fabre, Ubaghs, Branchereau, &c. See Werner, *Geschichte der apol. and polem. Liter.*: Vol. V., 59 seq. *Der Ontologismus.* Wien, 1885.

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reason, and all things else besides. The ideas of the true and eternal are given along with it; in it we see all things. The soul *immediately* grasps God, who is ever present within her as the one perfect being. In this way the two extremes lead by different roads to the same conclusion, viz., that truth (God) is known immediately, not mediately. When called upon to explain the ultimate reason why man accepts tradition, Traditionalists are driven to seek for it in the individual and collective capacity of reason originally bestowed on the human race. Traditionalism, therefore, ends where Ontologism begins. Both schools are unable to give a satisfactory account of our knowledge; both are powerless to gain a victory over false idealism. If the two systems were pushed to their ultimate conclusion, the landing-stage on which the passengers of both would disembark would be ideal Pantheism.* It is needless to add that their advocates did not draw this conclusion. To place the logical order of knowledge on a par with the ontological order of being, and to make God, who is first in the order of being, also first in the order of thought, is sound reasoning only in a Pantheist. From his point of view the immediate intuition of God is conceivable because, according to him, the soul, in becoming self-conscious, sees God in itself. But just as Pantheism is unable to cope with experience, life, and matter, so Ontologism contradicts the facts of experience and empirical consciousness. Neither can explain how the conscious is evolved from the unconscious, or how the *non-ego* exists before the *ego*. Ontologists and their followers who, in the intuition of God, perceive at the same time something outside God, must needs perforce invest something outside God with divine attributes. God is truly the light that enlighteneth every man that cometh into this world; but He enlighteneth man by hanging up in his soul the lamp of reason which enables him to see Creator and creature.

And yet, like two grains of wheat hid in two bushels of

* Compare Lamennais, Gioberti, and Rosmini.

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chaff, Ontologism and Traditionalism each contain a grain of truth. In opposition to the Sensist theory, the distinction between simple sense-perceptions and abstract ideas must always be referred to the objective contents of the ideas in the mind. From this it is easy to understand why history is being ever shaded with ontological tints. According to Plato, the soul, before being united with the body, had an immediate vision of the divine and eternal ideas. Thus the ideas of all things sleep in its bosom, but the memory can awaken them only by small degrees. But the doctrine of universal ideas, in this shape, is now all but extinct. Such a separation between soul and body is a baseless figment. The mind can never become possessed of what in no way falls under the senses. A blind man can never form an idea of colour, nor a deaf man of sound. Not only do sense-impressions in general set spurs to the soul and determine it to act, but the manner and direction of its action correspond to the sense-impressions. The impression made by sight, hearing, taste, and the like do not merely rouse general ideas from slumber, but produce a definite mental activity.

The immediate knowledge of God was a string on which the Arians never tired of harping. But their theory and Plato's doctrine of ideas were essentially different. For the Arians were devoid of all ideal thought, and, being strict Aristotelians, clung with tenacity to the logical categories. As they made the divine essence consist in ἀγεννησία they had no difficulty in advocating an absolute knowledge of God ; but it was a knowledge void and empty, like all absolute notions torn asunder from the things themselves. When Arius taught that God is incomprehensible, because ἀγεννησία is His essence, he showed the obverse side of the medal. Philo had argued that the *summum bonum* is unknowable for quite another reason, viz., because being above reason, no human power can conceive it. The Gnostics were at one with Philo in teaching that nothing can be predicated of God, except that He is. Fathers of the Church could not altogether shake off the

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consequences of this idea of God. Even for them God's nature is incomprehensible. But the study of Plato's philosophy had landed them in this conclusion.* Platonic mysticism fascinated the heart rather than the mind of believers by picturing God as moving about in obscurity and enveloped in twilight. The Neo-platonists, too, with their semi-pantheistic ideas, refused to include God in any category.

Ontologists generally number S. Augustine amongst their supporters. No one, conversant with his writings, will deny that his profound speculations are strongly tinged with Platonic ideas. His whole education had taken this course. Now, how does he proceed? He sets out from the fixed and immutable truths of reasons,—the ideas of unity, truth, beauty, and goodness, and thence he arrives at the conclusion that God is the one, the true, the good, the beautiful, and the highest conceivable being. Then he starts from another point, the mutability of created things (the human soul included), and argues that God is the wise and perfect principle of all.[6] From this it is abundantly clear that S. Augustine was not an ontologist; neither an immediate intuition of God, and of all things in God, nor even an immediate idea of God enters into his teaching; and he asserts only that knowledge of God which is derived from things, and some knowledge of truth on the part of the human mind. The doctrine of the Platonists who conceived God as the author of all being, the lamp of all knowledge, and the goal of all action, held him spellbound; but he modified the Neo-Platonic teaching about 'the intelligible" and the "intellectual vision." Eternal ideas—causes of things—he admits, but plants them in the divine intellect. The soul, by perceiving the unchangeable truth above it, thereby

* From the author's words, which are somewhat vague and general, the reader might easily be led to suppose that the Platonic Philosophy had exercised an undue influence on the Christian and Patristic doctrine of God. But the Platonic Philosophy was really only the *vehicle* of thought. (Tr.)

6 Storz, *Die Philosophie des heil. Augustinus.* Freiburg, 1882, p. 177, 69 seq.—Kleutgen, *Philos.* I., p. 84 seq. Werner, *Ital. Philosophie*, 1886, p. 200, seq.

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sees things in their eternal ideas (*in rationibus æternis*), but it does not see them apart from the perception of the things themselves. Of course, without ideas, ideal knowledge is impossible. Ideas, however, are not fixed in the mind as stars are set in the firmament; nor, again, are they infused ready made into the mind; but the mind is endowed with the power and the capacity to form them according to innate laws. Both the logical and the ontological method lead to the conclusion that an unchangeable spiritual being exists.

The doctrine of ideas was drowned in categories, and re son was swamped by intellect,* according as the Platonic philosophy was submerged in shallow or deep Aristotelian waters. When Platonism again rose to the surface it either enrobed itself in a Neo-Platonic Pantheistic garb, or dyed itself with an ontological pigment. Henry of Ghent expounded S. Augustine in a Platonic sense, and derived all knowledge from the immediate intuition of God. The Platonic doctrine was revived by the Humanists. Marsilius Ficinus, a Neo Platonist, figures as the chief representative of the apologetic school. Lutheran theology began by affirming that the human mind was incompetent either to know or to love God; but when the mind is set on the pinnacle of faith, its capacity for knowledge swells, and it soars up to great heights. It was Luther's own contention that human nature is gifted with a capacity for divine things. Melanchthon was filled with admiration for the old Platonic idea of God. To him God is mind eternal, and the cause of all good. He does not hint at an external revelation as the fount of his knowledge. The Cartesian School went a step further. They sought the source of all intellectual knowledge not in innate ideas merely, but in an intuition of divine ideas which are innate and essential to the soul. Descartes assumed innate con-

* The distinction between "Vernunft and Verstand" is unmeaning in English. So far as a distinction can be drawn to correspond with the German and to express the difference between Plato and Aristotle the phrase should be inverted: "intellect . . . . by reason."—(Tr.)

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scious ideas. Later philosophers assumed unconscious ideas, that is, innate ideas which might be considered as latent. In the judgment of Leibnitz innate ideas are a necessity since, without their aid, there is no accounting for the general truths of logic and metaphysics. Descartes' pupil was the first to set the ontological ball rolling.

Between the two polar seas of Sensism and Ontologism one can surely steer a middle course. According to an old never-to-be forgotten axiom, there is nothing in the intellect that was not first in the senses. Sensation is the beginning of knowledge. The sublimest scientific theories are compelled to draw on the world of sense for their formulæ. All language, the language of vulgar and learned alike, to be intelligible, must borrow its symbols from the outside world. But the principles and forms of knowledge are deep-rooted within the soul. Even if we merely re-echo S. Thomas'* words: "*Nihil est in intellectu nisi ipse intellectus*," we concede at least that there is in the human mind an aptitude to acquire knowledge.

Now, if the knowledge of God be tested by this principle it must be admitted that it is not an *immediate* but an *analogous*† knowledge, derived from the rational contemplation of nature. No man has seen God, for He dwells in a light inaccessible. Yet He is nigh unto every one that seeks Him. His dwelling-place is in man's hearts; the purer the heart, the clearer will be its vision of God. The Fathers, who followed Plato as their leader, teach that the idea of the unspeakable God, the word of God, λόγος ἔμφυτος, is implanted in the soul; but they add that it will neither grow nor blossom unless watered by moral uprightness. The ancient apologists, while deriving all truth and goodness from revelation, looked upon it nevertheless as merely giving clear and definite expression to something that was already within man. In their eyes all truth and goodness are at once Christian and human. Man's soul is by nature

* The author's words, as they stand in the original, are somewhat obscure. The saying quoted is from Leibnitz.—(Tr.)

† Wisdom XII. 5.

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Christian.[7] From the beginning his soul was blessed with that same consciousness of God which Tertullian tells us is common to Egyptians and Syrians, and the inhabitants of Pontus. He and other apologists were careful to point out a curious universal fact: In the hour of danger the very heathen instinctively call upon God, not this god or the other god, but God. And the most recent discoveries fully corroborate their statement.[8] Even Homer's heroes, the divine Eumœus included, at the critical moment when their heart-strings were ready to break, flung to the winds learned and mythological metaphors and regaled themselves with the ordinary language of Religion. Thus, in truth, does the Christian doctrine concerning God restore that pure and primitive human teaching which alone satisfies the aspirations of the human heart. Men are men, and the best sometimes forget, but the human soul can never forget its Father in Heaven for long. Human nature, even in its fallen state is irresistibly attracted to God. A spirit's essence consists in the power to love God, and to think of God. Its being consists in the power of becoming conscious of self and of God. As the river is purer at its source than at its mouth, so the nearer we sail to the source of the stream of time, the purer we find the ideas about God, though they be clumsily expressed. The Aryans prayed to *Dyaus Pitar*, Ζεῦς πατήρ Jupiter, the father of heaven, before they worshipped Heaven itself. And although Zeus and Heaven be with them identical, yet when danger is on the wing the human soul, with childlike instinct, runs for help not to Heaven but to Zeus. It only knows of God, simply and purely. To know and to understand aright the God of truth, says S. Athanasius, we stand in need of nothing but ourselves. Of ourselves we can discover the first cause. In ourselves is faith and

7 Tertullian *Apol.* II., 17. *De testim. animæ*, 5. Kleutgen, *Philos.* Vol. I., page 693, seq. *Theol.* II., page 35 seq. Fischer, *De Sal. infid.*, 66, a, 1. Tertul. *Adv.*, *Marc* I., 10.

8 Christian Pesch, *Der Gottesbegriff*, Freib., 1886, p. 41. Max Müller, *Essays*, vol. II., p. 10, seq. *Wiss. der Sprache*, vol. ii., p. 393; *Einleitung*, p. 155, seq. Möhler, *Neue Untersuchungen der Lehrgegensätze*, 2nd edition, Mainz, 1835, p. 60, seq. *Athanasiusder Grosse*, Mainz, 1827, vol. i., p. 149, seq.

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the Kingdom of God. We can speedily discern the Lord of the Universe, and the Word of the Father who bringeth in his hand salvation. The soul can know God in her own self. The atheist has to deny his own soul. Man knows God from God's image: but God has graciously condescended to aid the human mind with the visible creation on account of its infirmity. The Fathers are unanimous in asserting that as soon as man comes to the use of reason a certain knowledge of God springs up in his soul. Their explanations, however, differ; some considering this knowledge an immediate idea of God, others requiring for its formation an *impulse* from without. But all distinguish a spontaneous and involuntary knowledge of God from that acquired *a posteriori*. The soul begins to know God as soon as it becomes self-conscious and acquires the use of reason. The ideas implanted in the soul ἔννοιαι, ἔμφοτοι cannot be mere ideas spontaneously generated by the involuntary activity of the reason.[9] There must be an object to which the faculty of the soul corresponds. The spontaneous activity of the mind is necessary for the ideas to become conscious; but according to the Fathers, ideas are not the mere product of this activity. If the issue lay between this and the seed of faith, the word of the Gospel which is fraught with salvation, analogy would give judgment in favour of the latter.[10]

The one point at which the Fathers are constantly hammering is, that the idea of God is not the first idea in the order of knowledge. The tree of knowledge has an upward growth. Knowledge mounts from things below to the heights above. This is the only sense in which Gratry, Staudenmaier, Drey, Kuhn, and others now maintain the idea of God. They treat it not as an immediate knowledge of God, but as a metaphysical principle which strengthens our analogous knowledge of God, and gives a sufficient basis for the logical conclusions drawn from the principle of causality. Thus they supply a bridge on which the mind can pass over from formal thought to metaphysics.

9 Kleutgen, *Philos.*; Vol. I., p. 682, seq.

10 Ep. of S. James I., 21; Justin, *Apol.* II., 6.

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So this knowledge of God, before being developed by experience, is at most a kind of presentiment of the supernatural, a hidden sense of Godhead so to speak, and thus an anticipation of the existence of God.

It seems to us that all natural knowledge of God necessarily presupposes an involuntary consciousness of God heretofore undeveloped; or, perhaps it may be better described as a germ and disposition. The knowledge of God is stored up in the nature of the soul; no importation from without or laborious research is needed. The loveliest landscape has no beauty for the eye that cannot see; the sweetest music will fail to enchant the ear that is waxen deaf, like the adder. The sense-organs presuppose sensibility. A man with all his senses dead can never become a mathematician, a mechanic, or a physicist. So, too, there must be an eye in the soul. The senses are but channels between soul and brain. To the heathen, who asked that he might set eyes on the God of the Christian, S. Theophilus thus strikingly replied: Show me your man, and I will show you my God. Show me that the eyes of your soul see, and that the ears of your heart are open, and I will show you my God. There are no general fully matured ideas in the soul, nor do all ideas come from sheer sense-perceptions. Between the soul and the outer world harmony must prevail. Without some *a priori* assumption or other, the laws of thought and cognition, and the universal fact of religion are and will ever remain insoluble puzzles. On this point all can join in chorus with the Fathers—even those who hold that the soul is a blank, a *tabula rasa*, a tablet with no writing thereon. For even they assume that a general confused knowledge of God has been grafted on us by nature, inasmuch as all men have a desire for beatitude, that desire being fixed immovably in the will.[11] The "external mirror" of the visible creation implies an "internal mirror," viz., the intellectual and moral disposition of the soul. Man fashions his god according to his own tastes. His gods are a reflection

11 Theophilus, *Ad. Autol.* I 2, S. Thomas I., *Summ. Theol.* q. 2, a. 1, ad. 1.—Schneider. *Naturalvölker*, vol. II., p. 409.

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of himself. Truths which appeal to the conscience are duties before they are evident truths. They appeal to a mysterious instinct that lies deep down in the caverns of the soul, to an intuition that is felt rather than proved. Such an intimation, however, can be felt only by the pure of heart, and by men of goodwill. Assent to an axiom involves an act of faith. Man cannot even contemplate nature in the light of cause and design, unless aided by his will. The moral evidence must be intertwined with the metaphysical.

The assumption that the soul has an innate idea of God gave birth to a special proof for the existence of God which is consequently known as the *ontological* proof. Traces of it, more or less clear, occur in S. Augustine. It was the necessary outcome of Platonism. To S. Anselm, a Platonist and the pioneer of Scholasticism, belongs the honour of first throwing the proof into form and shape. As the Supreme Being exists in idea, he argues that He must also exist in fact, because what is supreme in fact is higher than what is supreme in idea only. A supreme being, so supreme that a superior is inconceivable, would be a logical paradox if it did not actually exist.[12] S. Anselm was not always consistent in formulating and propounding his thesis. He assumed that faith begets an immediate consciousness of God in the soul. But his main idea culminates in the conclusion he draws from the necessity of thought to the necessity of actual existence. The Aristotelian S. Thomas impugned the conclusion on the ground that the *a posteriori* knowledge of God can alone lay claim to the force of a real demonstration. This answer sealed the doom of the ontological proof for centuries.

Descartes was the first to restore it to its place of honour, and to make it respected in philosophical and theological circles. Descartes holds that whatever is perceived clearly and distinctly is also certain and true. Now no one will deny that we have an idea of God, that is, an idea of an

12 Staudenmaier, *Die christl. Dogmatik*. vol. II., Freiburg, 1844, p. 76. Kuhn, *Katholische Dogmatik*, Tübingen, 1162, vol. I., p. 648, seq.—Scheeben, *Handbuch der kath. Dogmatik*, Freiburg, 1873, vol. I. p. 474.

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infinitely perfect Being. This idea, however, would involve a palpable contradiction if the infinitely perfect Being were not conceived as existing, since existence is a perfection. The certainty of God's existence is therefore inseparately bound up with the idea of God. God cannot be conceived as non-existent, and therefore he must actually exist. The *point de départ* of Leibnitz is the all-real being. The all-real being is actual because it is possible, for it is possible only as a self-existing being (*ens a se et per se*). According to Gratry the existence of God is asserted in the proposition ; God is. For predicate and subject are identical. Being is = exists ; which is tantamount to saying : What is is. This "pneumatic" proof has been zealously championed by Staudenmaier and others. Can its conclusiveness be questioned by those who admit the inner facts of consciousness ? It is valid reasoning to argue from the soul of a man to a spiritual Creator. Is it not equally valid to conclude from the idea of God to the author of that idea ? In this way it is sought to rescue the ontological proof from the reproach of being a purely logical operation with only a formal value. It would seem that the cosmological argument runs into the ontological. This is so, however, only when the cosmological proof is stated imperfectly and with a bias, otherwise, even if it held good, its meaning would no longer be the same. For the necessity of the *a posteriori* proof is admitted once it is conceded (and it can hardly be questioned) that this idea has been transmitted by Tradition or ripened by external experience. Solely by the agency of abstraction, and the consideration of the world, the "glimpse" or "faint suspicion" buried in the depths of the soul has grown into the idea of the supreme and all-perfect being. The elements of the idea are furnished negatively and positively, by the objective reality of the world. The real existence of the latter proves that these elements in their united state must exist in reality as well as in thought, if things are to be adequately explained in their totality. Now, the soul of man being part of the totality of things can be at once the subject and the object of knowledge.

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Consequently the knowledge of God is due to the soul's contact with the external world, and to reflection on its own interior. But since learning and discursive thought enter into this process, the soul's innate glimpse of God cannot be said to be independent either of Tradition or of the contemplation of nature.

Traditionalism and Ontologism have been condemned by the Church. On September the 8th, 1840, Bautain was obliged to subscribe six propositions which teach that human reason can prove with certainty the existence of God ; that faith comes later than revelation, and therefore cannot be used to prove the existence of God against unbelievers ; that the use of reason precedes faith, and guides man to faith with the aid of revelation and grace. In 1855 the Congregation of the Index, with the approval of Pius IX., ordered Bonnetty to subscribe four propositions which declare that reason can prove with certainty the existence of God, the spirituality of the soul, and the freewill of man. The Vatican Council somewhat tones down these expressions, by substituting *certo* for *cum certitudine*, and *cognosci posse* for *probare*. Traditionalism is not mentioned by name, but, in its crude form, it is rejected by the definition concerning the knowledge of God derived from creation. This decision tells still more against Ontologism, inasmuch as it states that God can be known from creation as the beginning and end of all things. The conditions, however, are not specified. Previously, on September 18th, 1861, the Congregation of the Holy Office had formally condemned Ontologism by affixing various degrees of censure to seven propositions concerning the immediate knowledge of God, the merely gradual distinction between ideas (universals) and God, the knowledge of things from the innate idea of God, the derivation of other ideas from the idea of God, as being modifications of it, the existence of individual things in God as of the parts in the whole, and the explanation of creation from the inner intellectual Act of God.[13]

13 Denzinger, *Enchiridion symbolorum et definitionum* (5th edition), *Wirceb.*, 1874, No. 1516, seq. Koenig, *Schoepfung und Gotteserkenntniss*, Freiburg, 1885, *p.* 45.

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CHAPTER VI.

BEGINNING AND END.

We exist; the world around us exists. These facts we take for granted. For our present enquiry it matters little whether realism or idealism be the truer theory, whether or no things are in reality what they are in appearance. No dreamer or fanatic will ever succeed in uprooting universal belief in the objective existence of things. A wise man among the ancients said: That is true which appears so to all men. Natural science has indeed dealt a heavy blow at this axiom, but nevertheless its truth is generally allowed. Astronomy, Physics and Chemistry regard things in nature as fixed quantities. Are we then to be blamed for assuming at the outset the objective reality of the world?*

In all ages philosophers have racked their brains to unravel the knotty problem of the beginning and end of things. Theories as to the world's origin are not lacking in variety. Sometimes the result is ascribed to a single element, sometimes to showers of atoms falling through space and spontaneously grouping themselves. Other philosophers, again, invoked a higher cause, a good or evil being. But the speculations of natural philosophers were barren of result, and never satisfactorily explained how the world began. Even Plato and Aristotle were stopt in mid career by eternal matter, and the eternity of the world. Aristotle certainly did not make the soul revolve in perpetual circular motion; but his theory as to its creation amounted to little more than a confession that the

* The reader who wishes to study this question may consult with advantage Mr. St. George Mivart's *Nature and Thought* (Burns and Oates).

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origin of the divine element (τὸ θεῖον) in the soul (νοῦς) was buried in obscurity (*non liquet*).

These attempted solutions were fore-doomed to failure, because they sought nature's origin in nature's own principles.[1] The way was blocked by the axiom: *ex nihilo nihil fit*. Philosophers were powerless to shuffle off the coils in which this proposition entangled them. They had not courage to plunge forward and break new ground in search of a higher power as the cause of the world. Their idea of God was too ethereal; their god himself was too abstract and lifeless, too weak and feeble. They could not conceive a perfect being, who is being and nothing besides. An attempt has lately been set on foot to vindicate Aristotle. 'The philosopher,' it is alleged, taught that God has a will, and that the ideas of things are in God. The Schoolmen, however, who were fond of setting a Christian gloss on their favourite philosopher's writings, shrank from drawing this conclusion. Plato's idea of God is the most pregnant, yet even it is overhung with doubt. In his *Timæus* he certainly paints the world as created by the will of the good God. But Plato's peculiar doctrine concerning the ideas existing outside God, and his doctrine regarding the *non ens*, and the meaning of eternal matter prevent us from attributing to him the notion of creation, in the sense of a free act of God. Even the most favourably disposed critics are averse to seeing in it the idea of creation. Anyhow they confess that its meaning is not clear.[2]

Hesiod once mentions the creation of man. In Homer, Zeus, the father of Gods and men, recalls at least the old doctrine of creation. But here the influence of religion is patent. According to the Iranians, Ormuzd created heaven and earth. Assyrians and Egyptians also believed that heaven and earth had been created.[3] The ancient civilized

1 Albertus Mag., *De Cælo* II. 1. 1.—See *Theol. Quartalschrift* 1885, p. 6 seq.

2 Chr. Pesch, *Gottesbegriff* p. 50.—Commer, *System der Philosophie*, 2 vols. Münster 1884, p. 33.

3 Pesch, l.c. p. 9. Max Müller, *Essays* vol. I. p. 38 seq.

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nations of Mexico worshipped one of the Gods as supreme, and as the creator of all things. The Peruvians held that the world and man had a creator. Belief in creation is not unknown even among the negroes.[4] With regard to man, we make bold to affirm that the groundwork of all religions, be they ancient or modern, natural or supernatural is to be found in the saying: It is He who made us, not we ourselves. But that is all. Even in religions the complete idea of creation is seldom present. So far, not a trace of it has been found among the Chaldeans. On the contrary, the cuneiform inscriptions proclaim that matter is eternal. Perhaps it must be granted that all the ancient cosmogonies and all the philosophers of old regarded matter as more or less eternal. In their view God merely set the world in order.[5]

Why is this? The reason is partly internal, partly external. On the one side the way was barred by the principle of causality, and on the other side there was no idea of God, as a being infinite in power and perfection, to act as a lever against it. Man's nature is so clogged with things visible and sensible that it is unable, of itself, without a revelation from God, to grasp the distinction between temporal and eternal, finite and infinite, creature and creator. Even revealed truth is easily shrouded in darkness. Man's progressive sinfulness and his absorbing interest in matter have, more than anything else, tended to confound the ideas of creator and creature. The Fathers, in accordance with the doctrine of Holy Scripture, have ever taught that the existence of God can be known from nature and from the soul. Some of them were engaged in deadly strife with the evil principles of Gnostics and Manichæans; others had to fight against the bad use made of Aristotle by the Arians.[6] Athanasius pointed out long ago that, if

4 Schneider, *Naturvölker* vol. II. p. 262 seq. Max Müller, *Einleitung in die Vergleich. Rel-Wiss.* p. 233—*Wissenschaft der Sprache* vol. 2, p. 408.

5 See Nic. de Lyra *In Joan.* I. 52—Vigouroux, *Die Bibel* I. p. 175—Nadaillac, *Die ersten Menschen und die prehistor. Zeiten. &c.* p. 227, 237 seq., Edited by Schlösser and Seler, Stuttgart, 1884.

6 Petavius, *Prolegom.* III. 1. 7.

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pitfalls are to be avoided, both the analytic and synthetic methods must be used in all these enquiries.[7]

Dualism and Pantheism had entrapped Philosophy in their cobwebs, and Philosophy had never been able to disentangle itself wholly from their meshes. It would seem, indeed, as if it were impossible for reason to soar up as high as the first beginning of things. S. Thomas and his school, Durandus, Cajetan, Scotus, Bañez, Vasquez, and others, made this concession to the Aristotelian and Arabian philosophy : that philosophy cannot prove how the world began, and that faith is necessary to show this. Nevertheless they hold that the existence of God can be proved in the theistic sense. This may be possible by a strict logical method of proof. But, is such proof sufficient ? S. Bonaventure is not very wide of the mark when he asserts that a contradiction[8] is involved in the theory which says that the world is eternal or was made from all eternity, while all things are created out of nothing. Even if we distinguish the simple *position* and *adduction* of things by transitory motion, and thus conceive the eternity of the creature as communicated,[9] at any rate it would no longer be permissible to argue from things moved in time to an eternal unmoved mover, or to distinguish the eternal divine being from the eternal, successive, finite being. The substantial distinction between effect and cause, and between the thing moved and its mover is too easily effaced by mere logical priority that involves no priority of time. If the eternity of motion requires the eternity of the thing moved, the distinction between *æternitas* and *ævum* no longer holds good. From the distinction between necessary and accidental being (Suarez) it is impossible to see why there must therefore be a very great difference between the duration of an immortal creature and the eternity of God. As far as the doctrine of creation is concerned it is

7 Schwane, *Dogmengeschichte*, 2 vols. Münster and Freiburg, 1869, p. 278.

8 See *Theol. Quartalschrift*, l. c. Storz, l. c., p. 214.

9 Scheeben, *Dogmatik*, vol. ii., p. 10. Kleutgen, *Philos.* vol. i., p. 551. Commer, vol. ii., p. 39.

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perhaps unnecessary to prove that the world cannot have been produced by God except in time; it may suffice to show that its beginning in time is possible, and that the plea for the necessity of its eternal existence cannot be made good. But with regard to reason the case is different. It must sail into deeper waters, otherwise it will either be stranded on the shores of logical Pantheism, or strike on the rock of eternal matter. It may be confidently asserted that the Thomistic school would have had a more prosperous voyage if, like Albertus Magnus, S. Bonaventure, and others, they had had the pluck to throw Aristotle overboard and put at the helm the doctrine, that it is repugnant to the very notion of creation not to have a beginning in time.[10] For after all the Schoolmen had to argue with a reason that had been enlightened by revelation.

But are not many master-minds of all ages on their side? Is it not presumption to pit reason against them? If they consider anything incapable of proof it will not, of course, be proved with the lucidity and certainty necessary for establishing one of the first and most momentous truths. Some try to prove by reason that the world sprang out of nothing, and admit that its origin in time can be known, not from the nature of things, but only from history, and therefore from revelation.[11] But S. Thomas' answer is ready to hand. The world, he says, by not having existed always is much more clearly indicative of a divine creative power than if it had always existed. For evidently everything that has not always existed has a cause; but this is not so clear in the case of a thing that always was. Still the opposite theory is in fashion with the great majority of modern scientists and philosophers. "The idea of a beginning of time, or of limit to space" is to them unthinkable. They hold that we cannot in thought assign the commencement of the world to any given point because an absolute beginning of time is unimaginable.[12] But the same writers

10 Kleutgen, *Philos*, vol. i., page 553. Vigouroux, *Controverse*, 1183, n. 62, p. 357.

11 Kleutgen, l. c., vol. ii, p. 687 and 172.

12 Wundt, *Philos. Studien*, 2 vols., Leipzig, 1885, p. 499 and 527. Zacharias, *Ueber gelöste und ungel. Probleme der Naturforschung*, Leipzig, 1885, p. 12.

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challenge just as fiercely the validity of the proof for the existence of God, and deduce from these premisses the world's eternity. Were this fact to prove that the possibility of the world's eternity is not a contradiction in terms, it would likewise prove conclusively that the actual eternity of the world is possible. Then reason bound hand and foot would be delivered up to Monism and all its consequences. We are insisting on the proof that things had a beginning all the more particularly, because modern science has forged weapons that directly upset the Aristotelian theory of the eternity of the world. That experience is the foundation of science is a cardinal axiom in regard to all the exact sciences; at all events no proposition that contradicts experience can be admitted as certainly correct. Physics is the mainstay of metaphysics, and the latter is non-suited if it contradicts the known facts of experience. The saying: *Cognitio incipit a sensu* is true of all knowledge. It is doubly true of knowledge that covers the whole range of universals. We cannot, it is true, draw an inference from the possible and the logical to the real and ontological, but we may with all the more reason conclude from the real and actual to an actual cause.

Now what does experience teach about the beginning of things? It teaches as a fact proved with absolute certainty that some classes of beings have had a beginning. The human race undoubtedly had a beginning. With the Quaternary formation all vestiges of man completely disappear, and those in the Upper Tertiary are, to say the least, doubtful. Accidental causes cannot have obliterated all further trace of man, for the strata teem with remains of the forms of life. On this point science speaks with no uncertain sound. Here then is one class of beings on this earth that had a beginning. Here again we must therefore part company with Aristotle. Again, what is the teaching of science about marsupials, birds, reptiles, and animals generally? It traces the animal kingdom step by step from its highest to its lowest forms, till at last it reaches the Azoic period, in which no animal remains are

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found. Thus the animal kingdom also had a beginning. Plants, too, fetch the like shrill echoes from the hollow earth. Their different classes and species come forth in gradual order and succession. Thus plants also began to exist at a definite period. Time was when our planet was wholly destitute of organisms. Who dare challenge this clear proof from experience? Its bearing on the question of the beginning of things generally is unmistakable. Philosophers sometimes demonstrate how the world cannot possibly be eternal because its eternity would necessitate an infinite number of human souls, of organic beings, and so forth. Such arguments are good in their kind, but experience is more convincing. Palæontology, again, furnishes positive proof that things are limited both as to number and duration.

But Geology goes a step further. In conjunction with palæontology it shows that this very planet of ours has undergone a process of development in being gradually evolved from a chaotic mass into a dwelling-place of living organisms. Aided by the spectrum analysis, Physical Astronomy has attached the chain of proof to the planets, in which similar modifications are perceptible. All the heavenly bodies are composed of the same elements, and exhibit similar phenomena. Our solar system, all solar systems, in a word, the whole universe originated in a mass of gaseous or nebulous matter. This is not the right place to discuss the theory of Kant and Laplace as to the world's formation. Here suffice it to note that all the most complete modern theories start with a primitive element. Nowadays no other theory can be entertained for a moment. The "empirical eternity of the planetary system, of the earth, and of natural formations"* is, indeed, a "bold" theory since it dares modern science to the death; more than this, however, it argues either ignorance or bad faith. The theory of Kant and Laplace, the mechanical theory of heat, the spectrum analysis, and astrophotometry have furnished such incontrovertible proofs of a

* Czolbe.

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first beginning of things, that any man who denies or ignores them loses all right to be heard. Now we are straightway met by the question : Whence came the primitive matter? As everybody knows, modern science answers : *ignoramus et ignorabimus.*[13] We don't know, and we never shall know. Haeckel, Nägeli, and some others have, it is true, started an opposition : "We know, and we shall know." This, however, is a vague promise in the future, not only unwarranted by experience, but contradicted by it. By muzzling our knowledge, and allowing it to roam merely over the small territory owned by natural science, we shall only evade the question without answering it. About the first beginning of things science is silent. As to how and where the primitive matter originated science knows nothing. Before the first beginning and the last end of things a veil is spread, dark and impenetrable, through which the human mind cannot peer. But science presses irresistibly onward and overleaps its bounds. And since it admits that a number of things had a beginning, it must concede that the simple primitive matter must also have had a beginning in time. The eternity of primitive matter contradicts this fact, and does but substitute one puzzle for another. It is clear that primitive matter cannot have originated with matter, or it would *ipso facto* cease to be primitive. But it is, indisputably, something actual. It does not contain a sufficient reason of existence in itself ; in itself it is wholly indifferent to existence or non-existence. Hence unless science is to stumble over an unsolved problem lying across its path in the first stage of its journey, it must set itself free from the bondage of an infinite chain of causation (which is already broken, as we have said, by some facts of experience), and seek the first link of the chain in an eternal and higher cause. Every effect must have a cause, and therefore we cannot here go on *ad infini-*

13 Dubois-Reymond, *Ueber die Grenzen des Naturerkennens*, Berlin, 1872, 4th Edit. 1876. *Die sieben Welträthsel*, Berlin, 1880.—See Pesch. *Die grossen Welträthsel.* Freiburg, 1883, vol. I., p. 22, seq.—Nägeli, *Mechanisch-physiologische Theorie der Abstammungslehre.* Munich and Leipzig, 1884, p. 602. Lotze, vol. II., p. 11.

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tum. Through a labyrinth of causes and effects experience has conducted us to the inner shrine of primitive matter. But we cannot stop outside; we must penetrate into the shrine itself. There is no shirking the question whether or no primitive matter had a beginning. *How* it began is a further question which we shall examine later on.

There is no matter without motion and force. No such thing as inert matter exists. Or, in the language of Aristotle, there is no body but, in the real potentiality of matter, contains also the formal principle of its being as the determining cause of its action. This is borne out by daily experience, and the history of the heavens and the earth. Formerly this perpetual motion (*motus perpetuus*) was thought to be derived from separate spiritual forms or forces (*formæ separatæ*)—pure spirits, in other words, and every earthly motion required contact with them. Or, it was even contended (Heraclitus) that the universe was inexplicable without a world-soul (Panzoism). Now, however, the movement of the heavenly bodies is the prototype of all other movements, as is expressed by a mathematical formula which can be calculated with absolute certainty. The power of motion is immanent in bodies. All bodies remain in the respective state of rest or motion till acted on by an external cause. There is no exception to Galileo's law on the inertia of bodies. Modern science has invested with great probability the theory that the natural phenomena of light, electricity, magnetism, heat and the like are due to the vibration of very small particles of ether. Motion is inherent in the primitive elements of all bodies. From the first, matter must have been moved.

Whence came this motion? Aristotle (who was acquainted with none but external motion), setting out from the *movens motum* of the second cause, arrived at the *movens immobile*, the πρῶτον κινοῦν ἀκίνητον of the first cause. Newton, the first to discern in gravitation the physical explanation of the mechanism of the heavens, attributed to bodies a *vis occulta*—the force of attraction; but the necessary force of contact he could derive from naught else save

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the ἀκίνητον κινουν the first push. Kant, sheltering himself behind the development of the Cosmos according to the general laws of nature, ascribes it to mechanical causes, lest, like Newton, he should be obliged to refer it to the wonderful intelligence and creative power of God. Modern Philosophers and men of science follow suit, but are constrained to admit that all phenomena and all motion need the co-operation of several factors. For if this chain of causes be traced to primeval matter, then the first movement must be in primeval matter. How, then, can the atoms act on one another, unless each be endowed with a moving force? Even those who cannot assign a point at which time absolutely began, will come to a standstill in the causality of events, when they arrive at certain initial conditions beyond which all is hazy and indefinite. The chain of causes goes back indefinitely, if you like, but not endlessly. It is not infinite. In every cosmic system, a beginning must be reached, be the chain of causes never so lengthened out. A definite limit is a necessity. And yet the law of causality itself cannot be broken. In other words, the first movement, which must be assumed as a fact, is inexplicable; it is, as Wundt[14] observes, "something inconceivable to our ways of thought." It is beyond the jurisdiction of natural science, and must be adjudicated on by a higher court. Natural science assumes it and then proceeds to explain and define the laws, according to which the world, when once in existence, moves. Natural science, therefore, is hemmed in on every side by what is empirical; it can explain nothing but what is empirical. It busies itself with the mechanism of atoms; but their constitution, and the inward force that resides within them it passes by, unheeded and unknown. It traces effects to their causes; but it is powerless to prove the general validity of the principle of causation. Science is rendered possible by the notion of cause and effect; but it still bears the imprint of a law of logic. We cannot explain the efficiency with which the principle works. The

14 Wundt, l. c. pp. 509 and 529.—Zacharias, l.c., p. 164.

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effect is of necessity connected with the cause, but only the outer link is visible to the naked eye of man. We can only reach the inner connection by cutting our way through the intermediary causes to the first cause. But at this point science stops short. At these heights the atmosphere is too rarified for science to breathe or live. It can, however, discover with certainty that a first cause exists and is at work. That which was moved first must have received the power of movement from a higher cause. The *ἀκίνητον κινοῦν*, whence come the *κινούμενα*, is not a bare abstract idea, but a living absolute force that has caused all particular motion. Even on the theory of Kant and Laplace this conclusion is unassailable. For that theory is bound to assume primitive matter with its forces and movements. Unless then we would abandon all explanation as hopeless, nothing remains but an eternal metaphysical cause. From this intermediary causes derive their force. These latter are not causes, in the strict sense, but merely links in the chain along which the first cause passes, and perpetuates its influence. The explanation of the complicated phenomena of nature by the principles of motion, of the transposition and conservation of energy, of gravitation, and the like, seems clearly to indicate the unity of the principle by which matter with its forces was called forth from nothingness into being and life. In the first cause are contained both the beginning and the end of secondary causes. And the end of secondary causes is the purpose of the first cause. But to pursue this subject further would lead us into theology, which cannot be divided from cosmology by a hard and fast line.[15]

The end, however, may be looked at from another point of view, and hereby a beginning may be proved, in the language of the Schoolmen, *a parte post*. The eternity of the world precludes an end as well as a beginning. If the world is to have an end, it must also have had a begin-

15 See Knauer, *Grundlinien zur aristotelisch-thomistichen Psychologie*, Wien, 1885. p. 24, seq.—Secchi, *Schoepfung*, p. 12.

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ning. Between endless time, and the actual limitation and measurement of time there is, as S. Bonaventure maintained against S. Thomas, a glaring contradiction. To add anything to what is endless is impossible. To arrange, measure, or comprehend the endless is equally impossible. All temporal things would have long since come to an end, if they had been in a state of constant transition from not being to being in endless time. Branches cannot be lopped off from endless time and treated as finite. It will never do to regard the motion of the heavenly bodies as immeasurable, and without beginning or end, and at the same time to assert that there are parts in their ever progressive motion which we both measure, and use for the purpose of measuring others.[16] If, according to Aristotle, the movement of the heavens, regarded as a whole, does not fall in time because it has neither beginning nor end, the course of the stars might still serve as a measure of time; but its relation to the movement of the whole which is outside time, forbids its application to the whole. Thus the explanation is but a logical abstraction without any foundation. Temporal movement and development are incompatible with endless time. If time were endless everything must have come to an end. But the necessity of a beginning in time, of an act of creation, is shown by the fact that we always enter into relations with the outside world through the senses.[17]

But, theology apart, what is the verdict of empirical science about the end of the world? Physical astronomy declares that many of the heavenly bodies are in the dissolving stage. The moon is unquestionably an extinct uninhabitable planet. The red fixed stars, with their column-like spectra disclosing cinders, and the sun with its

16 Kleutgen, *Philos.*, vol. 1, p. 551. See *Quartalschr.* l.c.

17 Kant, *Critik der reinen Vernunft*, p. 338—Fick, *Die Naturkräfte in ihrer Wechselwirkung.* Würzburg, 1869, p. 70—Hertling, *Ueber, die Grenzen der mech. Naturerklärung.* Bonn, 1875—*Theol. Quartal.* 1885, p. 12 seq.—See Bonaventure II. Sent. q. 2, a, 2, ad 1.—Heinrich, *Dogmatik*, vol. v. 148. N. 2, Liebmann, *Analysis des Wirklichen*, 1876, p. 322—Konig, *Schoepfung*, p. 82 and 98 seq. Secchi, *Schoepfung*, p. 14; *Die Sterne*, Leipzig, 1878, p. 335.

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spots, must be pronounced in a state of decay. However distant the date of their dissolution, it will inevitably come to pass.[18] The volumes of gas given out by the stars reveal the powerful activity of those far-distant bodies, in which formerly we were wont to see only the stillness and the repose of death. It is merely a *quid pro quo* to substitute eternity for endlessly distant time, to exchange, that is, the potentially for the actually endless, and to describe the process of the world's formation as an asymptote, which though continually approaching some curved line never actually meets it. This is a logical operation which can but obscure the actual process. It is a fact that some of the heavenly bodies are losing their energy and sinking into a state of rest. And as all the heavenly bodies are similarly constituted and obey the same laws, it is perfectly valid to draw the inference that they will all come to an end. The mechanical theory of heat furnishes evidence in confirmation. Once the whole stock of energy passes into heat, and all the heat acquires an equable temperature, no further change will be possible, and the universe will be condemned to eternal sleep. Without the intervention of a special catastrophe, the universe will be transformed into a mass of matter of equal temperature, and then it will be impossible to convert the heat into energy. The world's energy is being scattered more and more, and is passing away in heat. According to the theory of the transposition of energy, all potential energy, without being destroyed, tends to a condition of equilibrium. But all the phenomena of nature depend on the differentiation of these forces. Hence, when the differences cease the world will come to an end.

Perhaps it will be asked : Is it not rash to set an absolute limit to forces of nature that, as far as we can judge, are practically unlimited in time and space? Against this

18 Secchi, *Sterne*, p. 113 seq.; *Einheit*, vol. I. p. 55 ; II. p 342—Pohle, *Die Sternwelten und ihre Bewohner*, Köln, 1884–5, vol. II. p. 48 seq.—Nägeli, l.c. p. 574—Clausius, *Ueber den zweiten Hauptsatz der mechanischen Wärme theorie*, Bonn, 1867, 2nd Edit. 1876, with the title: *Die Mechanische Wärme theorie*—Hertling, p. 26 seq. Tait, *Vorlesungen*, 1877, p. 17 seq.

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proposition various objections have been raised by Carnot and Thomson in their treatises on the conversion of all force into heat, a theory from which Clausius deduced his second law of heat, viz., the equivalence of the transpositions. The theory of the dissipation of the world's energy, they object, rests on two suppositions that are mutually destructive : the one, that the stock of energy is limited, the other, that space is infinite. Let therefore an endless time, equivalent to eternity, be allowed for this development. One who is groping in the "dark backward and abysm of time" can hardly hope to see through every difficulty. But the inductive method, which holds good everywhere else, certainly gives the force of extreme probability to the above law. The theory of an infinite force is broached in defiance of experience which has decided that it is possible to measure the quantity of force and energy in the universe. But the sum total of all measurable energy will never be equal to infinite energy. There is no need, therefore, for space to be infinite. Even if it were infinite, the same law enacts that there would always be a residue of heat in infinite space, and hence even then the equilibrium of temperature would be restored and chaos ensue. If it be said that the whole infinite universe can never come to a standstill although some systems may, it should be pointed out that such an assumption is a denial of the inductive method, which, in these matters, is alone available.

Nor do the changes wrought by man in nature place the conclusion in jeopardy. The discoveries in Physics and Chemistry have led to many different interchanges between heat and energy ; but these are likewise parts of the whole. In every steam engine a great deal of energy is lost, and a residue of heat remains. No alterations in these natural relations can be effected by the most ingenious discovery. No physical force produces mechanical force. All changes in nature are dependent on nature's laws. To deny their application to the beginning and end of things is to deprive the law of Clausius, which applies to things as they

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now are, of its force. But the right to make exceptions ceases altogether in the case of such an arbitrary assumption. It is abandoning experience to say that in the beginning the sun and the planets were composed of different elements, which differ also as to condition and position in consequence of the temperature being far lower than it is at present. The same remark applies to the final condition of things which this hypothesis assumes. In spite of these objections there is no denying that the process of equalisation is actually going on. And it will continue either until equal temperature reigns everywhere and the world becomes stiff and rigid, or until the nature of the chemical elements is reversed by liberated heat becoming again latent, and our planetary system returning to the state of gaseous atoms whence it issued.[19]

Why, it will be asked, is such a change impossible? Is not the opposition between mutability and inertia best reconciled by eternal rotation? Centuries ago Origen, perhaps under the influence of the "hypotyposes" of Clement of Alexandria, believed that in this lay the simplest solution of the problem of creation. In order to safeguard the eternity of the creator, he supposed an infinite series of worlds following one another in succession. This, however, as is easily seen, is shelving the problem, not solving it. Kronos, always swallowing his children, is himself a puzzle. Eternal rotation has no meaning except on a pantheistic platform. Here it cannot be used in explanation, because the absolute being must be presupposed as a living force. Being, in general, is a mere abstraction without motion, life or change. With natural science the case stands otherwise. All natural philosophers since the days of Kant, who would not accept creation as a final solution, have taken refuge in the rotation (*Kreislauf*) of the universe.[20] It is maintained that the theory of heat does not sanction an absolute

19 Nägeli, *Mechanisch—physiologische Theorie der Abstammungslehre*, München und Leipzig, 1884, p. 670.—Liebmann, *Analysis des Wirklichen*, 1876, p. 382—Wundt, l.c. p. 536.

20 See the literature in Pohle, *Die Sternenwelten und ihre Bewohner*. Köln, 1884-1885, Vol. II., p. 48 seq. No. 84.

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end of the world, neither does the Kantian ball of nebulous matter represent the absolute beginning of the world. Moreover, as regards space and time, they say that the infinity of the world is, *for us*, a real *regressus in infinitum.* But the initial and final condition arrived at by this empirical *regressus in infinitum* has in reality only a relative importance. Rather it is a *regressus in indefinitum.* After all, what is the infinity of the world but a mere supposition? And, if it were infinite, how could it have a new beginning? Who or what is it that changes the condition of the atoms, by substituting the negative for the positive?

All the questions that we have been discussing are ever recurring. Unless it is proposed to build up the world on chance and accident, there is no loophole by which to escape from the much dreaded conclusion. By seeking to explain all phenomena by the terms matter, force, and motion, we are degrading our terms to the level of the merest symbols, and furthermore we are attempting to explain one unknown quantity by a second which is still more obscure. Whence come force and matter? Whence came the first matter that was moved? Experience knows not. The answer will ever be a secret.[21] Neither the atomistic nor the dynamic theory has sounded the world to its bottom. Both fail to reach the ultimate reason and essence of things. All our chatter about matter, force and law is but a paraphrase not an interpretation of the phenomena of nature. Nature nowhere gives a sufficient reason why the actual condition of bodies is necessary. On the contrary, contingency meets us at every turn. At any rate it entails the necessity of admitting that a higher cause was at work in the beginning. At this point mechanics stop. Of the *Whither* and the *How* it knows nothing. The first cause cannot be merely the first link in the long chain of causation; it is at the same time the principle, and the self-existing cause. Faith gives to this absolute cause the name of God.

21 Dubois-Reymond, l.c, p. 16, *Natur und Offenbarung*, 1871, p. 246. Zacharias, l.c.p. 31 seq. Nägeli, l.c. p. 584.

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This first proof for the existence of God, drawn from motion and from things conditional, possible, and imperfect, goes in apologetics by the name of the cosmological argument. In the foregoing pages mere insistence on logical conclusions has been as far as possible avoided, in order to parry the objection that thoughts alone are personified. Nor was it intended to discuss the existence of a cause acting all along the line of causality, and thence to conclude that there is a cause underlying the whole chain of causation, and yet distinct from it. It was merely proposed to trace all the active causes empirically to their source. This explanation will, of course, be rejected by all who demur to assign the movement of original matter to a higher cause. Even if the law of causation, as Stuart Mill and Schopenhauer contend, were to refer to the form and not to the matter of things, still the matter, so far as it is moved, would be subject to the law. Of course, exact science neither knows nor admits the idea of creation, but anyhow it is more in harmony with reason than the theory of a spontaneous origin, or eternal circular motion (*Kreislauf*). It is folly, says Vives, to try to prove creation from the laws of nature, since creation transcends nature. If, however, science shows that the world had a beginning and that it will have an end, and if further it cannot be poised absolutely on beginning and end, then nothing but the theory of absolute life will satisfy the dispassionate mind. This theory will give us an opportunity of subjecting the first cause to a more exact scrutiny.

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CHAPTER VII.

LIFE.

In Nature there is motion, activity, and life. Without motion nature would be unintelligible. Take away life, and nature is shorn of purpose. What is it that gives to nature its unfading beauty and bewitching charm? That most subtle and mysterious kind of motion which we call life. Plants of various hues and tints cover the ground with a coat of many colours, and the earth, in turn, extracts from the vital activities of plants the lovely ornaments that deck field and forest. Then, again, how admirably fashioned and endowed is the animal kingdom! It is from its unceasing activity that the universe derives its greatest beauty. Look at nature where we will, life and motion meets us at every step. The plant or animal that we trample under foot, howsoever vile it appear, because it has the breath of life within it, is as far above all its inorganic surroundings as the heavens are exalted above the earth. The senses instinctively bow down before this truth. The winds and waves of criticism may beat against the distinction between organic and inorganic bodies, but they will never shake it, for it is built upon a rock.

The same chemical and physical forces are, it is true, at work in both organic and inorganic nature; but the "direction and combination" of the forces is essentially different. In organic bodies there dwells a mysterious "something" which guides all the forces to combine for a different end,—such end being always in unison with the nature of the body. The different results are not due solely to the different conditions

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under which the forces of organic and inorganic matter respectively work. For conditions merely accelerate or impede the development of Nature's forces, but do not impart to them a totally distinct tendency. The organism is compared to a machine, in which the several parts combine to produce a definite effect; they both, so to speak, have to be fed and kept going, the one by water, the other by steam. But where is the superhuman engineer who makes all matter act like a self-forming, self-guiding machine? All living organisms, even the simplest and the lowest, differ fundamentally both from mere aggregates of inanimate substance, and from works of human industry. The lowest form of living being stands in closer relation to man than to an inanimate, structureless granule of protoplasm.[1] Man and the amœba are substantially the same, for both are alive. It is futile to try and explain life as a "complicated movement of particles of matter," or, as a "special form of co-ordination." Though there be but a simple exchange of matter through the wall of the cell, and a mere beginning of spontaneous movement, organic life moves on a much higher plane than the finest crystal. The plant takes root in the ground, draws its nourishment from the soil, carries the sap to the leaves and deposits it, after it has been decomposed by the sun and mixed with carbon, in its proper place. The animal lays hold of its food, grinds it mechanically with its teeth, moistens it with saliva, and passes it through the gullet into the stomach. The peristaltic motion of the stomach, combined with the action of the gastric juice, convert it into chyme. Then it passes into the intestines, and with the aid of the bile becomes chyle. Thence the nutritious portions are conveyed by a thousand channels to the several organs. The several forces at play can be detected in each stage of the process. But how comes it that these forces are combined so wondrously in the organic world, and nowhere else? Whence comes that wonderful force which, in all ages, has been christened Life?

1 Dressel, *Der belebte und unbelebte Stoff*, Freiburg, 1883, p. 67.

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Life was commonly supposed to have sprung up out of the bowels of the earth. The Greeks and Teutons believed that the gods were the primitive ancestors of the human race. They believed too, that life, in the first instance, issued from the inexhaustible resources of Mother Earth, who supports and nourishes man.[2] Ancient poets and philosophers not infrequently sang of man's slimy origin. From Aristotle the doctrine of spontaneous generation (*generatio æquivoca, spontanea*) passed into later philosophy and theology. The Schoolmen considered it self-evident, even in the case of the largest animals. To prove the possibility of the transformation of bodies Origen[3] instanced the production of serpents from man's spinal marrow, of wasps from a dead horse, of maggots from a donkey's carcase, and worms from many animals. And, be it noted, he quotes these as well-known instances. No one dreamed of doubting that the origin of worms and creeping things was to be sought in slime and damp, and in decaying animal and vegetable matter. In a treatise on Natural Science published in the ninth century the mouse is defined : a small animal born of the moist earth ; whence it is called *mus* (from *humus*). In a compendium of Theology ascribed to S. Bonaventure, the conversion of the rods into serpents is set down as a miracle *præter naturam*, because it happened not by a principle but after the manner of nature. For the same result could have been achieved in the order of nature by the more lengthened process of decomposition, as may be seen from the action of germs (*rationes seminales*).[4] Considering the slight progress that had been made in the sciences of Embryology and Physiology, it is not surprising that this theory should have

2 Max Müller, *Wissenschaft der Sprache*, vol. 2, p. 423.

3 *Contra Celsum*, 4, 57.

4 Fellner, *Compendium der Naturwissenschaften aus der Schule zu Fulda im 9 Jahrhundert*, Berlin, 1879, p. 139. *Compendium totius theologiæ veritatis* . . . . collatum per fratrem Joannem de Combis, Lugduni, 1569. Friburgi, 1880, C. 28, p. 48. Schwertschlager, *Die erste Enstehung der Organismen nach den Philosophen des Alterthums und des Mittelalters mit besonderer Rücksichtnahme auf die Urzeugung*. Eichstädt, 1885.

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found favour with heathen writers. Even nowadays the unsophisticated will feel disposed to account by *generatio æquivoca* for the flies that crawl out of manure, the worms that swarm in putrefying flesh, the grubs that come forth from the chrysalis, the parasites that feed on intestines, and such like phenomena. Christian writers accepted the supposed facts from heathen philosophers, although they seemed at variance with Christian principles and philosophy. But the seeming contradiction did not induce them to modify the doctrine of creation. From contemplating the accidental motion of the earth, and the effects produced on the earth and its inhabitants by the varying position of the heavenly bodies, notably of the sun, they came to regard the motion of the heavens, so marvellous in its regularity, as the cause of all the motion of the earth. The *virtus cœlestis* calls into being the lower forms of bodies. To it are also due generation and corruption. Light is really the medium by which plants and animals are, as if by magic, brought forth from the elements. Light, moreover, plays a part in the production of the higher classes of animals. Thus, having in part mistaken the condition for the cause, they were constrained to admit that the heavenly bodies bore some resemblance to things on earth produced by their influence. *Simile sibi simile agit.* They did not, however, regard the heavenly bodies as the first and only cause. Far from it; for they too require an invisible mover. There is only one being who moves others and is himself not moved. Neither are the elements purely passive. Primitive germs were infused into them in creation, which can be roused into activity by light. But the ultimate cause of life, the cause of all life, is the living God, in whom all life dwells, who has life in Himself.

Modern Science has unearthed fresh facts which shed further light on the enquiry into the origin of life. It is now scientifically demonstrated that all organisms, even the lowest fungi, are multiplied by generation. The tiny single cell of the torula (yeast), the dimensions of which are as 1 to 3,000, is

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formed spontaneously. The countless infusoria in decaying organic substances are in no sense transformed organic particles Many parasites, heretofore a mystery, are fully accounted for by the doctrine of *alternate generation.* Research has now verified in every department the principle: *Omne vivum ex ovo.* Every organism has for its parent an organism like to itself. Some living creatures consist of a single cell,— a tube with very little in it; but even these presuppose a parent-cell from which the others sprang. The microscope has revealed the wonders that lie hid in this little world. But, although we have gained a deep insight into the elements, we are no nearer to discovering a transition from inanimate to animate nature Just as the telescope by decomposing nebulous spots tells us little about the origin of the firmament, so the microscope gives little clue to the origin of life by disclosing an organic world. in a drop of water. Haeckel thought that the moneras were the primordial beings. Nägeli informs that the moneras are comparatively highly organised. According to Nägeli, there are two earlier stages of formation. The first lies in the synthesis of inorganic matter with albuminous combinations; the second lies in their organization into micellæ, plasma molecules, probia, and protobia. These, in Nägeli's opinion, are the beginnings of life. But hitherto we knew as little about them as we know how albuminous corpuscles originated by synthesis outside organic beings.

Experiments have also shown that spontaneous generation is a figment. The experiments of Pasteur, Tyndall and others have proved, beyond a glimmer of doubt, that no living being is ever evolved from inorganic matter, provided all the necessary precautions are taken to prevent the introduction of organic germs from air or water. Despite the frequent repitition of the contrary statement, exacter researches have proved Pasteur to be in the right. If it be objected that such precautions, especially the exclusion of all non-purified air, destroy the conditions of spontaneous generation, the rejoinder is

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plain: It has to be proved that these are the conditions of spontaneous generation. In reality these precautions do but expel organic matter from the air. Thus the combined forces of experiment and experience are marshalled against spontaneous generation. Might it not, perhaps, have taken place when Mother Earth was in the full vigour of youth? The same plea, it will be remembered, was put forward to account for the beginning of being; now it is urged to explain the beginning of life. The criticism that we gave above is applicable here also. But here the *petitio principii* is more glaringly obtrusive, because experiment has put it out of court. To rely on an appeal to unknown forces is to cut from under one's feet the ground and method of exact research. There is no need, as S. Augustine and the Schoolmen have remarked, to bring miracles on to the stage in the first scene. Since the days of Lyell it has passed current as an axiom that no extraordinary catastrophes are needed to explain geological phenomena, the forces now at work being amply sufficient. With what front, then, can any one offer to explain the process of life by appealing without proof to forces other than those which now exist? It may be that life was then more prolific and blessed with greater fecundity; but life was already in existence. And since, too, there was an Azoic period, a period when no life existed, the transition has to be explained. In the primitive rocks (which, from being originally sedimentary, have been changed in form by the agency of heat and water, under immense pressure) there may be traces of life, as is now contended. The question, however, is not solved thereby; it is only pushed back a step. The doubtful *Eozoon Canadense*, found in the chalk strata of Canada, and the still more doubtful *Bathybius* of Haeckel, found at the bottom of the sea, do not show this so-called solution in a very favourable light. The *Bathybius* may improve on acquaintance; meanwhile, be it noted, Huxley, its discoverer, has relegated it to the shades. This primordial slime, which is the supposed home of spontaneous generation, is nothing but a precipitate of

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not lime.[5] The deep sea bottom, doubtless, teems with life, but not with primordial living matter. As regards the beginning of life, the conclusion is not far to seek.

The case would have to be tried on other grounds, if the contention were set up that spontaneous generation has been and is always going on,[6] when the requisite conditions are at hand. After what has been said above, all eyes will be turned anxiously towards the proof of this assertion. Anxiety will give place to astonishment when it is further stated that no such proof is feasible, because the products of spontaneous generation elude the most powerful microscope. At this point we are reminded that Copernicus justly laid the blame on his instruments when the annual parallax of the fixed stars failed. The two cases are said to be analogous; but in reality the circumstances are very different. In the days of Copernicus, the Ptolemaic system, appearances notwithstanding, had very slender probability on its side, and extremely complicated calculations against it. But the doctrine of spontaneous generation is set up in defiance of experience and experiment. And therefore positive proof is needed before judgment can be given in its favour. The existence of lower organisms is altogether irrelevant to prove that spontaneous generation is going on now; for it begs the question, inasmuch as it presupposes the organism. Moreover, in the series of palæontological fauna, a gradual progress from the lower to the higher and more perfect organism is discernible. From this it follows, of course, that the lowest organisms are also the oldest,—which is actually the case. Nor, again, is there any difficulty in understanding that they can subsist through all periods simply by propagating themselves. If lower organisms are *now* coming forth from inorganic matter, the higher animals are, of necessity, being evolved even now from the lower. And yet no Darwinian, even the boldest and the bravest, has

5 See *Theol. Quartalsch.* 1876, p. 407. Secchi, *Schöpfung*, p. 20–37. Pohle, II, p. 63 On the *Eozoon Canadense*, see Württemberg. Jahreshefte, 1876 and 1878.

6 Nägeli, *Abstammungslehre*, p. 15, 464—Schaaffhausen, *Anthropol. Studien*, p. 110.

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the hardihood to enter the lists in support of this contention. If all matter were alive, as is maintained in Panzoism, Panpsychism, Epigenesis, Pangenesis, Peripangenesis,* and other theories, the question of spontaneous generation would be split up into two parts: Whence came the original animal matter? How have organisms been evolved from it? Haeckel's Plastidul-perigenesis derives life from the periodical undulations of living particles. But, in the first place, this theory takes movement for granted: then it confounds the part with the whole, and finally fails to distinguish the motion of life from motion in general. Such blind conjectures can hardly be taken seriously. To derive life from matter, by changing the definition of matter, is a proceeding that stands self-condemned. It is like trying to square the circle, or going in search of perpetual motion. Inert matter is credited with having the power to animate itself. According to Nägeli, even the micellar formation of starch-granules presupposes at least a cellular liquid containing sugar. In like matter, what is called the "spontaneous generation of protoplasm," is simply a product of the properties inherent in molecules of protoplasm. Thus, by tracing spontaneous generation to *organic* matter, the doctrine of descent is veering round in a vicious circle. A mere combination of molecules of protoplasm is unequal to producing even the lowest organism. Albumen, in its liquid form, has been placed under a variety of conditions, and yet, as even the advocates of the mechanical theory of the doctrine of descent allow, organisms never ensue. But what about the formation of albumen itself, which, strangely enough, is taken for granted? It is something unique in the organic world. The development of germs is appealed to as a parallel case. But the appeal must be dismissed, as germs are already a living force. If, by analogy, the first drop of plasma of the first organic being be endowed with the power for such formation, we are still confronted by the same unwarrantable

* Heraclitus, Leibnitz, Buffon, Harvey, Darwin, Haeckel.

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and improbable supposition. There is no escape from this vicious circle so long as the attempt is made to derive like and unlike from the same source. Furthermore, inorganic matter is being changed into organic matter every day under our eyes, not, however, in virtue of its own powers or of a special disposition in the matter itself. Plants (which have life) are the natural intermediaries through which the exchange between organic and inorganic nature is effected. The amount of "natural" skill required in the process may be gauged by the fact that human art, the most perfect, has never succeeded in accomplishing the feat. It has, indeed, produced chemically[7] some of the lower organic forms—e.g., urine, starch, &c.; but these are the result of analysis, and, moreover, are devoid of the essential element, life. Life, it is true, is motion, but motion so peculiar in kind that no art or skill of man has heretofore succeeded in imparting this mode of internal motion to chemical products. Even dead albuminates have not yet been made artificially. The attempt to strike the ovule from off the list of organic bodies is an evidence of the kind of success that is likely to wait on the effort to produce a living organism from dead matter.[8]

How comes it then, in the face of all this rebutting evidence, that the majority of scientific men accept the doctrine of spontaneous generation? Two reasons may be assigned: the formal methods of science, and a dread of the hyperphysical and supernatural which scientists regard as a cloak of ignorance. In his first epoch-making book on the origin of species by means of natural selection, Darwin recognised the creation of primitive types as a necessity. But his more advanced followers whispered into his ear: *principiis obsta*. Resist beginnings; nip the principle in bud. Admit the interference of a supernatural power

7 *Ausland*, 1870, No. 40, 1874, No. 1.—Klein, *Entwicklungsgeschichte des Kosmos*, Braunschweig, 1870, p. 154 seq.—Dressel, p. 160—*Natur und Offenbarung*, 1883, p. 252 seq.—*Unser Wissen von der Erde*. Vol. 1, *Allgemeine Erdkunde*. Leipzig, 1885, p. 721, seq.

8 Götte, *Entwicklungsgeschichte der Unke, als Grundlage einer vergleichenden Morphologie der Wirbelthiere*, Leipzig, 1875. See Liebmann, *Anal.*, p. 344.

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in one case, and it cannot be eschewed in others. Darwin hearkened to their voice, for their reasoning seemed just, and in his later work, *The Descent of Man*, withdrew the concession he had made. Others shrank from cutting away the bridge from under them, and stopped short. They merely rejected the common view of creation, according to which creatures were supposed to have come forth ready made from the Creator's hand, and each species to have originally appeared on the scene independently. Natural history, they say, lends no countenance to such a view. If creation, they further say, be considered not merely as a thing of the past, or as a momentary act, but as a coherent divine force abiding in all time, then the doctrine of descent is so far from denying creation that the natural history of evolution alone gives a true idea of creation.[9] But the chorus and many earnest men of science cry down even this scanty concession. On the one hand they are willing to grant that spontaneous generation is not proven, but on the other they insist that it has not yet lost its case. "If," they say, "a supernatural origin of the first organisms be left an open ques-"tion," the principle of causation demands that no miracles be admitted. "It is," they proceed, "not so much a question of "observation and experiment, as a fact that follows from the "law of the conversion of energy and of matter."[10] A fact deduced from laws! No. The facts that follow from certain laws and that cannot be established by experience or experiment are precisely metaphysical facts. Are we content with analogy? Analogy declares that only the organic can organize the inorganic. From the fact that the telescope reveals no inhabitants of the heavenly bodies, we are certainly not justified in concluding that they are inhabited or uninhabited, unless the analogy of the earth being inhabited is to hold good. In a region, however, that cannot be surveyed by the microscope, analogy completely breaks down. How far the comparison is

9 Alex. Braün, quoted by Zacharias, l.c. p. 62 and 43. Zacharias himself also, and Lotze, *Mikrokosmos*, 4th edition, Berlin, 1184. Vol. I., p. 57 seq.

10 *Unser Wissen*, p. 722. Nägeli, p. 83.

valid may be seen from the attempt to use the alleged analogy in solving the question.

If neither angels nor huntsmen, says St. Augustine, conveyed animals to desert islands, these must have sprung up immediately out of the soil.[11] Nowadays, when spontaneous generation is denied, men have recourse not to the angels of God but to the forces of nature. The earth is but a small island in the vast universe to which living beings may have passed over "*natando*" from other islands. This conjecture commends itself to many scientific men: Thomson, Helmholz, Sterry, Hunt, and others. Who knows whether or no the heavenly bodies harbour organic beings? To this question we shall return later. Most astromoners are at one with ancient poets and natural philosophers in thinking that some stars are inhabited.[12] It has been thought of late that meteorites furnish positive proof that organic beings xist in space, inasmuch as these cosmic strangers are supposed to exhibit traces of dead organic matter. Thus the question as to the possible transference of life would be advanced a stage, but the heated condition in which meteors reach our atmosphere, be it due to friction or other causes, is not exactly favourable to the preservation of life-germs. They are so parched up in their passage through the realms of space, void of air, that all capacity for germinating is destroyed.[13] Even if it be granted for argument's sake that this grain of evidence is enough to sustain an hypothesis, so wide in its bearings, what follows in regard to the origin of life? Nothing, save that the problem is referred for solution to another sphere. But, even in the planets, different kinds of forces and a special kind of vitality are not to be assumed without proof, unless the basis and principles of all enquiry are to be cut from under our feet. Then we too should be drawn into tne whirlpool that engulfs all who seek the

11 *De civitate Dei* 16, 7. See Alex. von Humbolt, *Kosmos*, I. p. 489.

12 See Pohle, *Die Sternwelten und ihre Bewohner*, Köln, 1884-5

13 *Unser Wissen*, p. 723. *Kosmos* I p 373. Nägeli, p. 84.

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solution in matter alone. If we would steer our barque safely to land, we must avoid the shoals and quicksands, and confess that the beginning of life is to be sought not in the sphere of ordinary causes but in the unfathomable ocean of almighty power. It is vain to seek elsewhere. Darwin himself admits that the theory of natural selection is inadequate to explain the origin of life on earth. Speculation on this point he deems unprofitable.[14] The most divergent schools of thought end by an honest confession that they are angling in a lake of darkness. Given, however, the beginning of life, natural selection may serve to explain the physical and chemical development of plants. But, there's the rub. This very beginning is precisely the mysterious knot to be unloosed. In the lowest plant there is something incomprehensible besides mechanism and chemistry that presses these last into its service and parts with them only in death. Thus the candid scientist is driven to admit that the mechanics of nature are insufficient to account for the formation of organic beings. To account for physical and chemical phenomena he postulates atoms, molecules and ether. On the same principle he is bound to allow the postulate which the origin of living beings makes, viz. : a force beyond nature. From the standpoint of science he is at liberty to characterize as a relapse into ancient metaphysics any attempt to scale the heights above nature. For our purpose it is sufficient if the man of science defines the limits in which the mechanism of nature acts and beyond which it is of no service in explaining phenomena. If he admits as an ultimate fact, the spontaneity of the action that distinguishes so markedly and withal so simply animate from inanimate bodies, and that broadly divides biology from other sciences, then the explanation of the most important natural facts is banished to a province that lies beyond nature. Life dwells in none but living beings ; from them only can it proceed. The first germ did not spring up of itself.

14 *Abstammung*, Vol. I., p. 50.

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The cause of life, therefore, must itself be living and actual. The living God, who has life in Himself and is life, is also the sole author of life. This is the goal to which both the Platonic and Aristotelian philosophies lead. For the universal ideas that bring individuals and their changes under a uniform system of law, and the "*entelechiæ*" that are the groundwork of organic development, both converge in an absolute living cause above nature, who gave to life its beginning, and who holds all organic life in the hollow of his hand. So far chemistry has been vanquished in its efforts to produce a germ-cell with a power of development; so far human industry has been foiled in trying to forge the link, "life-force" as it is called, that couples the disjointed elements into an organic whole and holds their several forces in check. The single thread by which to feel our way out of the maze is the confession that here we stand on holy ground. The foregoing argument from life in nature to a living, life-giving Creator may be considered the second stage of the cosmological proof. In it the author of all being is proved to be living. Our faculties are paralysed when we seek to picture to ourselves an absolute life existing from all eternity, who has in himself the basis of being and of life, and in whom we live and move and are. But as there is no alternative between autogony and eternal life, the choice is simple.

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CHAPTER VIII.

THE VARIOUS FORMS OF LIFE.

Nowhere is the saying that variety has charms more strikingly verified than in the organic creation. Let the student of nature gaze where he will, he is at every step filled with admiration, and his senses are lulled with delight by the wonderful panorama of life that is passing before his eyes. The meadows with their green background and flowers of fairest hue; the luxuriant vegetation of tropical forests; the melodious birds with their georgeous plumage and sweet varied notes enchanting every ear; the very wild beasts that roam through the forest—each, in its way, holds the naturalist spell-bound. If, moreover, he is vouchsafed a glimpse of the creatures that people the ocean depths, as he scans these ethereal forms of delicate structure glistening in the bright sunlight, he will stand still wrapt in wonder, and grow astonished at nature's magnificence. But the kingdom of nature is not even yet exhausted. The microscope has unfolded to our gaze a world of organism in every drop of water,—a world not less wonderful in its kind than the immense worlds revealed by the telescope. A few figures may help the mind to realize nature's prodigality. The number of animals is now computed at two-hundred-and-fifty thousand species. Of plants there are over two hundred thousand phanerogams, and twenty thousand cryptogams, besides numerous varieties. Then, again, it must be borne in mind that not even individuals of the same species are exactly alike. Children are unlike their parents; and there is often a notable difference between the young of the same pair of animals, even in the

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same litter. In a waving cornfield hardly two stalks can be found in every respect the same. This manifold diversity in nature charms the student but perplexes the philosopher. Given that life is in existence and has started on its career: are the forces and laws of nature equal, of themselves, to bringing forth this countless variety of organic forms? or are there, here and there, yawning chasms that cannot be bridged over, and which thus point to the action of a higher power?

These questions hardly occurred to natural philosophers of the olden time. They knew of no fauna and flora, save those actually flourishing, and their knowledge of these was the narrowest. But on that account these engrossed the attention of philosophers and theologians all the more. The tendency of their thought, however, is evident, since they ascribed the origin of highly developed animals to spontaneous generation. In early times philosophers aimed at reducing the world to a few elements. Epicurus thought that the world had been formed by the chance-groupings of showers of atoms falling through space. In the didactic poem of Lucretius there is a striking though somewhat rough sketch of the theory of descent. To Pliny the transformation of species seemed a self-evident truth. Theophrastus and others held the same view. It was long believed that according to the letter of Holy Scripture all species were created in the beginning just as they now are. The Fathers taught, on theological grounds, that poisonous plants and hurtful animals had been created after the Fall. Philo had doubts about the literal interpretation of Scripture. He distinguished between the real and ideal, and thereby strove to make God's dealings with the ideal world intelligible. S. Augustine, following in his footsteps, broached another theory, based partly on theology and partly on science. He thought it was more in keeping both with the eternal character of the act of creation and with the temporal character of the creature, to limit creation to a single instantaneous act that should coincide with the first moment of time. Thus science

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would have a free hand, and all conflict between science and faith would be avoided. His profound speculations, it is true, bear the stamp of Platonic ideas rather than of scientific research. There is more guesswork than scientific results running through them. Nevertheless it was a sublime idea to concentrate the divine creative power in one act, where time and eternity, finite and infinite meet. It was also a sublime idea, to view the whole range of created beings as the reflection of the eternal divine ideas which were, so to speak, planted in the earth as life-germs. Thus the *rationes seminales* in God became, in a certain way, living germs in the bosom of the earth which, at the Creator's bidding, were to bring forth fruit in due season. Holy Scripture seems to bear out this view. God said: Let the earth bring forth the green herb; let the waters bring forth the creeping creatures with life; let the earth bring forth living beings, each after its kind. Augustine's great name, which has ever been a power in Western Theology, gave weight to this theory. Isidore of Seville, Bede, and others followed Augustine's teaching on simultaneous creation as on other points.

The Schoolmen who, in the main, favoured the Aristotelian and Greek cosmology and view of creation, could not remain altogether outside the circle of Augustine's magnetic influence, and they allowed as much authority to his theory as to that of the Greeks, according to which each species was created in its present state. Their strict idea of species and their pitiless logic notwithstanding, the Schoolmen were carried by the Aristotelian philosophy further down the stream than Augustine. For while Augustine claimed that germs of all kinds were created by God, the Schoolmen were not indisposed to interpret the doctrine of matter and form in the sense of an organic development, and to attribute all changes to certain germs, *entelechiæ*, with a tendency to certain types. Matter craves for form. The simple form aspires to the higher and more complex, the inanimate to the animate, the *anima vegetativa* to the *anima sensitiva*, and this last to the *anima rationalis*.

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The same process is constantly at work in embryonic development. The human fœtus has first the life of a plant, then of an animal, and finally of a man.[1] A purely natural development, however, was far from the minds of the Schoolmen ; their eyes were ever fixed on the *virtus cœlestis*, the *prima causa*, and the *primum movens*. It is open to question whether the development they had in view was genetical or merely logical. Some, like Albertus Magnus, certainly advocated the real transformation of species ; but we must not lose sight of the fact that, in the Scholastic theory, secondary causes are but the tools with which the first cause works. It is quite certain that the Schoolmen never dreamed of teaching that the diversity of forms on earth was due to chance ; nay, they often reject this view by an indignant appeal to Holy Scripture. Both the creation, they say, and the *distinctio rerum* come from God.[2] God differentiated all things by clothing each one with its own proper form.

Modern Science has at its disposal greater facilities for bringing these theories to the test. The conjecture of S. Augustine is to day an evident fact. The different species appeared gradually on the earth's surface. Many have passed away, and others have taken their place. Palæontology makes it clear that the different forms appeared only gradually and at long intervals. First came the elementary forms. These have disappeared to make room for others, and the same fate has befallen them in turn. The order in which plants appear is : cryptogams, monocotyledons, dicotyledons. The oldest undoubtedly organic remains are found in the Silurian formation in the form of sea-weed or zoophyte. There are plants likewise in the Devonian beds. In the carboniferous strata we have

1 S. Thomas, *Summ. c. Gent.*, 3, 22 ; 2, 89—*De Pot.* 3, a. 9.—See Commer, *System*, vol. II., p. 162, seq.—*Theol. Quartalschr.*, 1885, p. 40, seq. Kleutgen, Philos., vol. II., 633.

2 S. Thomas, l.c., 2, 39, 43, 45.—On Albertus Magnus see Meyer, *Geschichte der Botanik.* Königsberg, 1857, vol. IV., p. 47 and 63. On the Greeks see Zeller, *Ueber die Griechischen Vorgänger Darwins*, Berlin, 1878. Pliny, *Hist. Nat.* 21, 11: *Convolvulus tyrocinium naturæ lilium formare discentis.*

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the age of the cryptogams; here the earliest traces of conifers are found. In the Dyassic or Permian rocks there are numerous fossilized remains of ferns, palms and conifers. The Mesozoic or Secondary formations are not much in advance of their predecessors. The Triassic formation (red-sandstone, muschelkalk and keuper) contains gigantic calamites, cycads and conifers. In the coal found in Hungary and the Alpine districts are enclosed cryptogams, conifers and cycads. Dicotyledons and foliated plants appear for the first time in the chalk formation, in company with conifers, cycads and cryptogams. The Cainozoic or Tertiary formation brings us considerably nearer to our own time. A genuine tropical fauna is found in the Eocene or older Tertiary formation of Central Europe. Palms, bamboos, laurels, fig trees, poplars, elms, birch, magnolias, &c. appear in the Miocene formation. In the Anthropozoic or Quaternary formation we find the present flora distributed geographically and according to climate.[3]

The animal kingdom exhibits a similar gradation. Mollusca (cephalopoda and brachiopoda) crustaceæ, fishes, arthropoda, reptiles, birds, and mammals follow one another in regular order and succession. Trilobites, arthropoda and radiata make their first appearance in the Silurian rocks. Corals, sea-weed and mollusca come next, and then we get a first glimpse of the cuttle-fish. The extraordinary pterichthys is unearthed in the upper strata of the Devonian beds. In the Carboniferous beds trilobites disappear, and the brachiopoda are represented by the productus. Spiders and insects first come on the scene in the upper division. The Dyassic (Permian) deposits contain the first amphibia and reptiles, besides numerous ganoids with heterocercal tails. In the Red Sandstone are found frogs and the first traces of birds. The muschelkalk contains new encrinites, ceratites, the first long-tailed

3 See *Unser Wissen von der Erde*, p. 560 seq., 610 seq.—Quenstedt, *Epochen der Natur*. Tübingen, 1861, p. 288 seq.—Probst, *Fauna und Flora der Molasse in Oberschwaben—Württemb. Jahreshefte*, 1879, p. 221 seq.; 1881, p. 114 seq.; 1184, p. 65 seq.—Fraas, *Von der Sündfluth*, Stuttgart, 1866, p. 128 seq.

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crabs, and marine saurians (enaliosauria). Genuine ammonites have been discovered in the Alps, and crocodiles in the Upper Triassic (New Red Sandstone).

The Dolomite mountains in the Rhætian Alps (Secondary Formation) lay claim to the oldest marsupials. Belemnites, ammonites, saurians and marsupials are entombed in the Jura, and tortoises, flying lizards, birds, corals in the so-called upper white Jura, and land-saurians (Dinosauria) in the peat formations. The belemnites and ammonites that characterize the Jura disappear in the upper chalk strata. The Tertiary is the formation proper to mammalia. Unlike the implacentalia, monotremata and marsupialia of the Triassic formation, the monodelphia or placentalia appear for the first time in the Eocene and in Europe, without intermediate forms. Almost all classes of extant mammals are represented here; hoofed beasts, semi-apes and apes. In the Miocene and Pliocene we see the second great mammal formation. Here the mastodon, the dinotherium and others, apes too, and gigantic salamanders found their last resting-place. The Quaternary formation opens out a third great mammal world which includes the mammoth, bear, reindeer, rhinoceros, musk-ox, horse, stag and others. Here we come in contact with existing fauna.

Such is a brief digest of the evidence that palæontology offers in regard to the various forms of life. But before judgment can be given, evidence must be collated from other cognate sciences, *e.g.*, geology and geognosy, which explain the formation and succession of the strata. One thing is quite clear; the earth's crust has been formed and transformed by slow degrees. The order of succession is, in general, tolerably certain, but it is exceedingly difficult to determine how much time the process has occupied. The services of mineralogy, botany and zoology are, it is needless to say, indispensable. Nor can physiology be ignored, since embryology plays an important part in all speculations as to modes of life. It should also be borne in mind that, when historical evidence is wanting as to the

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transformation of species, the decision must rest with physiology.

The earliest attempts in modern times to account for the various forms of life were purely speculative. Herder and Goethe were of opinion that the forms of animal and vegetable life had come forth very gradually from an original type. Camper and Oken gave too subservient a berth to natural philosophy to obtain lasting results. Buffon's theory, that species arose from the degeneracy of fundamental types, gives the lie direct to experience and palæontology. The teaching of Benoit de Maillet,[4] who held that perfect organisms spring from the imperfect, is as opposite to that of Buffon as the antipodes are to us. In Benoit de Maillet's view the development is brought about by external conditions and changes in the mode of life. Lamarck[5] went even greater lengths in applying this theory to the animal kingdom. The infusoria and the worm, he says, originated in spontaneous generation, and from these two primitive types, molluscs, fishes, reptiles, birds, mammals and man have been gradually evolved. Use and disuse of organs, change of circumstances necessitating change of life, and the tendency of lower forms to become higher and more perfect, are the factors that have effected this development. Thus, he remarks, the giraffe's neck is long because it used often to be stretched into the air to reach the high branches of trees; in like manner, the long tongues of the woodpecker and ant-eater are due to their peculiar mode of feeding. Geoffroy Saint-Hilaire, an admirer of Goethe, applauded Lamarck to the echo, laying the utmost stress on the change in external conditions that marks the geological epochs. But as all these theories lacked both a solid foundation and exactness of method, botanists and zoologists had no difficulty in exposing their threadbare and illusory character. Linnæus, unsurpassed

4 *Telliamed, ou Entretiens d'un philosophie indien avec un missionaire français*, Amsterdam, 1748.

5 *Philosophie zoologique*, Paris, 1809, 2nd edition, 1830. *Histoire naturelle des animaux sans vertèbres*, 7 vols., 1815-1822.

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as a systematizer, made fixity of species the groundwork of his system; to explain the totality of the species he called in the aid of creation.[6] De Candolle and Agassiz gave this theory a push forward. Jussieu and Cuvier quitted the beaten track, but Jussieu in his botany and Cuvier in his zoology entered the lists against Geoffroy Saint-Hilaire and upheld the doctrine of the constancy of species with such marked success that in France it was, till quite recently, deemed impregnable. Cuvier's knowledge of comparative anatomy enabled him to construct a complete skeleton out of a few bones and teeth found in the Tertiary formation. His admirable experiment was calculated to stop the mouths of those who asserted that development might be due to chance or external causes. He, too, like De Candolle and Agassiz, denied that there had been a general gradation. The supposed grades are fallacious, because they apply to the whole creation principles that hold good only on a small scale. They are but tableaux, not continuous grades. As the entire living world had been destroyed by great catastrophes, there was free scope for a new creative act. De Candolle completely ignores grades of perfection. Agassiz allows their existence, but denies their simplicity. He also concedes that the highest representatives of a given group are nearly always superior to the lowest representatives of the group immediately above it. Of evolution, in the proper sense of the word, he knows nothing, and despite his gradation from imperfect to perfect he holds fast to the doctrine of the constancy of species. Hence the pivot on which his system turns is subordination of character, not affinity of descent. On this principle he drew up a plan of creation. In the several types and classes, orders and families, in the several genera and species he sees embodiments of the divine ideas. Modern science, he thinks, has in the main confirmed the old idea of creation that was set in a poetic and religious light in the Old Testament, and subsequently

6 See Körner, *Die logische Grundlage der Systematik der Organismen.* Wundt, *Philos. Aufsätze*, 2 vols., 1885, p. 217, seq.

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expounded philosophically and theologically by Fathers and Schoolmen. Thus the dictum of Bacon is ever fresh and ever true: A deep study of nature leads man's mind to God. Agassiz lived to hear his theory branded as a "scholastic fallacy" that confused ideas with things.

But now thought began to bend its course in an opposite direction. By and bye geologists like Lyell, and palæontologists of the stamp of Forbes, Heer, and Göppert grew convinced that the formation of the earth's crust and the accumulation of organic remains had all along proceeded slowly and steadily, without the intervention of great catastrophes. It was natural to apply the principle to the organic world also, because at that time artificial gardening and cattle-breeding, in England especially, had been carried to such a pass of perfection. Several English naturalists, Wallace and Darwin included, essayed to introduce this method into the kingdom of nature. Brilliant success awaited Charles Darwin, with whose name the doctrine of descent is henceforth inseparably linked. In his work on the *Origin of Species*,[7] he diverted the doctrine of descent into quite another channel. Within the last decade it has found so much favour that the great majority of naturalists are evolutionists if not Darwinians. True, he passes over the problem of the origin of life. He allows also original forms, which may have been four or five or even one in number. But, as was remarked at the time by Professor Bronn, the translator of the work into German, only time was needed to extend the principle both in a forward and a backward direction. Haeckel and other German Darwinians volunteered to perform this congenial duty. And Darwin, in his later work on the *Descent of Man*, overtook his vanguard. He denies the constancy of species, and flings to the winds our very notion of species. Descent is the key with which he unlocks the mystery of the manifold variety of living forms. The new and fas-

7 *The Origin of Species by means of Natural Selection*, London, 1857 (German Edition, Stuttgart, 1860.)—*Animals and Plants under Domestication*, London, 1867 (Stuttgart, 1868.)—*The Descent of Man*, London, 1870 (Stuttgart, 1871.)

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cinating element that he introduced into the doctrine of descent is an agency with the power to change species, which he derived not from fancy or philosophy, but from nature herself. He solves the problem with three agents: variability, inheritance, and natural selection in the struggle for life, or the survival of the fittest. Variability shows how parent types disappear; Inheritance explains how changes are propagated; finally, Natural Selection tells how useful variations are transmitted. In the flora and fauna of to-day we see the outcome of the process which can have worked only by slow degrees, and during vast periods of time.

Nature is, in truth, full to overflowing with variety. No one disputes this; nay, we gave special prominence to this truth at the beginning of this section. We have only to use our eyes to see nature's variability daily in action. There is no doubt that variability can be artificially promoted by external agency. Every gardener knows, for instance, how to change the colour, size and shape of the leaf. Need one enter into the feats that natural selection has accomplished in horses and dogs, sheep, pigeons and the like? But variability is at work everywhere in nature herself. The same plant will show differences in character according to the nature of the soil in which it is set. Much will depend on whether the soil is rich or poor, damp or dry, sand or chalk. Sometimes plants have all the colours of the rainbow. On high mountains they are smaller in size, but firmer in texture; they likewise take deeper root and are more highly coloured; but if set in the plains they will lose these properties. Animals, indeed, are more easily acclimatized; still, as to size, colour, hair and the like, they are capable of endless variation. Variability, then, as a principle is in general indisputable. Opinions, however, will differ as to how far the principle is to extend. Variability is assuredly limited in both artificial and natural selection. Even the advocates of an unlimited capacity for change are forced to restrict it to a "certain sense," and to assign to it a "definite character." They must

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needs allow that it is far from being demonstrated by present experience, and that, without a knowledge of all the earlier forms, complete certainty cannot be had. In this way the scientific question is merged in the historical, and an exact solution becomes impossible. Both in nature and in artificial breeding variability is, as a matter of fact, confined within narrow limits, and in nature it is merely transitory. It does not act in a straight line or on one side only, but it moves on a plane in every direction. Like a pendulum it oscillates to and fro round its centre, one swing succeeding and neutralizing another, the centre being determined by the character of the species. According to locality and nourishment, plants change their colour from a dark blue to a dazzling white; the circumference of the leaf varies in the ratio of 3 to 7; petals are transformed into anthers and vice-versâ till the time of full blossom. But never yet has variability been known to break through any definite species in the animal or vegetable kingdom. It is easy to see the typical character in every variety. Compared with the fundamental characteristics, individual differences are insignificant and of secondary importance. In the same way, morphological and physiological properties undergo no change, be they never so long under the influence of food and climate. The shape, rim and position of the leaf are apparently of little or no moment, yet they are throughout constant. Similarly the biological properties (e.g. the time of blossoming) can never be permanently changed by external causes. Even in such variable families as the hawk-weed (Hieracium), the rubus and the rosa with their unnumbered varieties, the specific type stands out prominently in individuals that are hardly distinguishable, and the varieties are constant in character. No matter how many and varied the intermediate forms may be, no genetic transition has yet been found.[8]

With domestication, however, the case seems otherwise.

8 See Nägeli, *Abstammungslehre*, p. 236, seq., p. 287 and 310—Wigand, *Darwinismus*, vol. I., p. 53, seq.

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Thus, there is little doubt that our kinds of wheat have arisen from a wilder species. Our numerous breeds of dogs, sheep and pigeons may have sprung from one type. Still even here there is a fixed limit beyond which variability cannot pass, although its handiwork is deeper and more permanent. All varieties preserve the primitive type. Neither pigeons with big crops, nor sheep with bandy-legs and fat tails, nor hornless cattle nor hairless dogs belie their species, although they are abnormal specimens. The most refined natural selection has not succeeded in producing a new species, and it has been equally unsuccessful in changing a fox into a dog, or a rose into a lily or a tulip. Even the crossing of wild species (by which many a garden-variety has been produced) is limited to species that are near of kin. To pretend that the breeder can mould an animal or vegetable organism to his will, as if selection were a magic wand for raising every possible form of life, is to turn a deaf ear to the teaching of experience. In truth the breeder's sphere of operations is bounded by the qualities he finds in nature, and nature brings forth only such varieties as are well defined and exactly suit the species in question. No breeder would lay heavy stakes on producing a variety not sanctioned by nature, e.g., a cock without a tail, a pigeon with spurs, a poppy with yellow blossoms, a blue pumpkin or a blue orange, a yellow grape or a yellow centifolium. And even if it were possible to obtain these results under domestication, nature in her free state, would rise in rebellion against the pressure put upon her, and, tearing away her borrowed finery, would again clothe herself in her native colours and resume her old habits. The Darwinian theory, as Nägeli remarks, was not hatched in a philosopher's study, but, although it has ransacked every stable and pried into every dove-cote, its view of nature, especially of the vegetable kingdom is, to its shame, most narrow. A breeder, ignorant of the principles of descent, may at times imagine that his experiments have issued in a new species. Such a mistake, however, would not prove the

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need of re-adjusting the definition of species. For the notions of variety and species will ever fluctuate. Not every systematic species, it should be noted, is a natural species. Many homologous species, e.g., hoofed-beasts, insects in the Molasse or soft sandstone (Miocene) found in Switzerland coincide with common prehistoric forms and must be explained as mere varieties or polymorphisms. Although systematic species will have to be greatly reduced in number, variability will not thereby be invested with unlimited powers.

The apple falls not far from the tree : here is a saying that holds good in the teeth of all variability. Permanent qualities are always inherited. Every new living being necessarily existed beforehand in the germ. Variation cannot be the normal condition of growth. There are monsters in the animal kingdom, and many a bird has hatched a cuckoo's egg. But a cuckoo laid the egg, and a cuckoo came out of the egg. The ducks hatched by a hen are ducks still in spite of the hen, and make for the water. Monsters are caused by obstacles in the path of development, and pass away. The marvellous metamorphoses that take place in the insect world are subject to the same law.. Out of the egg, whether laid on a leaf, on fruit or on an animal, crawls the larva which passes into the chrysalis state before becoming a perfect insect. Plants are even more fettered by their characteristics. Men do not gather grapes of thorns or figs of thistles. The leaves of oak and elm always differ ; an acorn is never the same as the root of the oak. The organization of a plant invariably depends on the parent stem, and the specific nature of the growth is determined by descent. The internal conditions of that growth are fixed, and are written in history. It is impossible to trace uniformly to a prototype the ultimate structure of the tissues that characterize certain systems ; they are determined by the species. Slight varieties (e.g. the full blossoms of the chestnut, the slit leaves of the beech) which do not change the species can also be traced to internal causes. Indeed it is ex-

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tremely difficult to point to any external specific conditions in the embryos of plants and animals. Still, according to a scientific axiom, founded on the law of causation, general facts must be referred to a common principle. The larvæ of molluscs and worms are similar, but their development is very different. The species, as a disposition, is contained as fully in the egg as in the hen. The difference between a hen's egg and a frog's egg is as great as the difference between a hen and a frog During the three weeks of incubation the contents of a hen's egg are changed into a chicken without any notable increase or diminution in the matter contained in the egg. Consequently all the properties of the fully developed egg must be potentially present in the egg-cell, although the microscope fail to detect them. We need more light to find this dark problem out. The attempt to establish a complete identity of embryos has signally failed. Professional Darwinians exposed and tore into shreds Haeckel's clumsy scheme in which the embryos of the tortoise, the hen, the dog, and man were drawn to one and the same scale. Haeckel apologized. He had drawn up the scheme, he said, on purpose to bring out the points of agreement into bolder relief! The breath of such an excuse will hardly resolve his deceit into dew; it cannot but awaken mistrust. Such is the progress of development in organic beings. The matter changes, but life and form remain the same. The same plan of organization pervades all species of plants and animals. Running through them all is a uniform law of formation peculiar to the species. The life of plants and animals unfolds the eternal generic idea that lies hid in germs, "*entelechia.*" All living nature therefore is governed by this law: the germs of organisms have a specific character which keeps variability within narrow bounds.

Was it always so? Had not variability a freer hand when the earth was younger? The answers of Darwinians to this question, though variously shaped, are all in the affirmative. Variability, they say, has now all at once been arrested in its course; formerly it was free to roam at large.

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The gaps that formerly separated parent and child have now been filled in. Species, even in their organic structure, are now recognised as fixed ; but, it is contended, they have arisen historically in the same way as fixed or relatively fixed conditions have been brought about by human agency. Hence they are variable only at a certain evolutionary stage in their long existence. Here we are again confronted by precisely the same manœuvres as in the question on the origin of life : a supposition not proved, incapable of proof, and incompatible with scientific methods, coupled with the admission that science cannot solve the question in the manner desired ! History is a province altogether foreign to natural science, and cannot even supplement it except by showing forth the past and present history of organic beings. History, however, has filed an affidavit that the animal and vegetable worlds have ever been the same as they now are. The drawings of animals on old Egyptian frescoes leave no doubt that these same animals have peopled both ancient and modern Egypt. The barley-corns found in the pyramids produce the same fruit as even now grows in Egypt. Many animals and plants have undergone absolutely no change even since the ice age. Palæontology supplies forms without making any disclosures as to their origin. From its raw materials it is impossible to decide with certainty to what extent variability has been at work, since the descent of palæontological deposits, unlike that of extant organisms, cannot be traced. The intermediate forms, which could throw light on the question, are very often missing. The hypothesis that attempts to supply the missing links by alleged variations inside the egg, has but few supporters.[9] For the variations in the colour of plants, which seldom pass from blue to red or white, are too inconsiderable. *Natura non facit saltum* is an axiom of both ancient philosophy and modern science. Nor is meta-

9 See de Lestrade, *Les théories de la vie jugées dans l'œuf.* Paris, 1886. *Controverse*, 1886. June, p. 303. Nägeli, p. 184 seq. On the other side see Schaaffhausen, p. 147.

morphosis, with its evolution by leaps, a case in point, since it is not subject to variation. The new short-legged breed of Anconian sheep, whose progenitor was born at Massachusetts in 1791,[10] only shows that there are sudden variations in race formation which art alone can keep constant. In nature such abnormal qualities are effaced by competition and crossing. The missing links in the palæontological chain are too numerous to be replaced by a chance hypothesis. This hypothesis, like the theory of selection, postulates a net-work of organisms, whereas palæontology and the kingdoms of life show forth only a gradation of classes.

And now, having reviewed experimental facts, let us probe the internal theoretical reasons. What then is variability? Its nature and essence are an unknown quantity. Darwin himself cannot explain the origin and cause of development. We are still in the dark as to its nature. The whole process of evolution reveals a power that human nature cannot fathom. Food, light, temperature, climate and the like are, of course, external causes of variations. But who shall lay bare the internal physiological cause? External influences are, on the whole, unimportant and have only an external effect.[11] They are, indeed, an indispensable condition of evolution, but they are powerless to bring about any substantial change in the formative principle. Excessive heat or cold is equally injurious to organic life; but small variations do not become constant. Anyhow there is no explaining why the slight variations of recent organisms are reproduced by an internal affection of the system of reproduction. Here again Darwinism starts with a fact unascertained by science. It has to be admitted at the outset that there are sexual differentiating influences in animals and plants that cause like parents under like circumstances, to produce offspring

10 Zacharias, *Probleme*, p. 64.

11 Nägeli, *Sitzungsbericht der mathematisch-physikalischen Klasse der bayer. Akademie*, Munich, Nov. 18, 1865; Feb. 1, 1873. *Abstammungslehre*, p. 7; 12 seq.; 102 seq. See also Schaaffhausen, *Anthropol.* p. 138 seq. on the other side.

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which is, to a certain extent, unlike. Now we are standing in the presence of the unknown. Here the variations are no longer effected by purely mechanical causes, but by an internal tendency and disposition. The determining factors must lie in the organism itself. The organism is the efficient cause that summons new forms into being. That part of the protoplasm which contains the life proper must be endowed with an hereditary disposition for certain organs (*Idioplasma*), and be at the same time susceptible of external stimuli. All the properties and forms that develop later are already latent as dispositions, and are transmitted by propagation. The idioplasm is variable, since it is both dependent on internal and external influences, and moreover acts as a formative principle (*nisus formativus*).[12] Thus we are again happily brought face to face with the Pangenesis of Darwin and the Plastidulperigenesis of Haeckel—the only difference being that these last are arbitrary hypotheses for explaining a supposed evolution, whereas the former, while admitting the active element within, seeks to derive it, in the last instance, from an inorganic source. To appeal to the molecular forces inherent in the substance is again to plead ignorance. Whether the power of producing forms be ascribed to the smallest particles (micelli) or to matter in general comes to the same thing in the end. So far this is the best hypothesis, for it sets out from the certain fact that the nature of the organism, on which the propagation and specific development of the individuals depend, is to be sought in the constitution and disposition of the smallest particles of the substance. This, however, is stating a fact, not explaining it: the real cause has still to be found. For the present we are leaving the main issue aside. Meanwhile Nägeli owes it to the public to give some positive reason for assigning an endless variety of dispositions to idioplasm. If this endless variety is contained in minute drops of idioplasm—too minute to be detected by the

12 Nägeli, *Abstam.* p. 184 seq. *Unser Wissen von der Erde*, p. 689, 704-5.

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microscope or any physical or chemical action—*their* origin is a still greater mystery. The fact that the ontogenetical growth of the idioplasm is vertical and its phylogenetical growth horizontal may serve, in some measure, to illustrate Professor Nägeli's system, without, however, affording any clue to the problem of life. Nature is replete with wonders; but the subtle ramifications of idioplasm in its wanderings from the first cell to the souls of men throw all nature's wonders into the shade.

Inheritance is not a brand-new invention, but it seems out of place in company with variability. Variability aims at changing, inheritance at retaining existing properties. How then can inheritance hold an important place in the theory of evolution or transmutation? But the importance of these two principles lies precisely in their union. It is a question, forsooth, of the inheritance of variations. Varieties are frequently propagated in certain races. In many families certain peculiarities become stereotyped. Breeds of domestic animals arose in this way. All these forms are now fixed, but they have not ceased to be subject to the law of variation. Nor is this all. Characteristic features and peculiarities are transmitted to the offspring in the same historical order, at the same time of life, and in the same parts of the body as they appeared in the parents. From Atavism, too, we learn how one peculiarity of grandfather or great-grandfather or of some remote ancestor, after a length of time, re-appears. The dark stripes of many horses recall their descent from the zebra. The pelonites or regular flowers of the dandelion are also invoked as a proof of descent. But Atavism tells more against than in favour of heredity, for it shows that the principle is often at fault. This is allowed even in Darwin's Pangenesis, according to which the qualities are inherited from the cells of germ-corpuscles, but do not come into action till generations have passed. Nägeli smooths away many difficulties by supposing many inherited qualities to be latent. Thus it becomes strictly true to say that the offspring is merely the resultant of the matter and

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force of the parents. What is not present is latent; what is more strongly marked than heretofore was formerly latent! Not all characteristics, and variations least of all are inherited. Gardeners and cattle-breeders, wishing to preserve or increase a particular stock, must take measures to banish all strange influences and to keep competition at arm's length, or the variety will soon be lost. Nature has no such resources, and hence individuals are exposed to every wind of influence. The animals again draw nearer to the parent type. Varieties in the colour and formation of the leaf, and the like, disappear, as a rule, with the individuals, and re-appear by accident, it would seem, in other individuals only to vanish again. Alpine plants which, during many years' growth on the mountains, have acquired a new character in size, colour or aroma, or in the formation of the leaf or hair, lose this character when they are transplanted to the plains either from the seed or in shoots. The species remains without the variations. If these last have disappeared, the numerous individuals in which they were ingrained must have perished likewise. But if generation among like follows a definite type into which small variations gradually creep, these facts would seem to tell against the inheritance of variations generally. Inheritance is so irregular, so uncertain, that on scanning the facts he had himself gathered together, Darwin, from the crown of his head to the sole of his foot, was all astonishment at the freaks of the law of heredity.[13] Haeckel's fundamental biogenetical law gives a curious insight into ontogenesis; still it is very doubtful whether it has more than the weight of a pretty analogy for turning the scale in favour of phylogenesis. It would be more than wonderful if the law of inheritance were so complicated. In the beginning every individual, even in the highest class, is a single cell, a simple ovule. Even after fission the germ or embryo proper is barely distinguishable. All the bodily organs of mammals are developed from the folds of

13 *Abstammung*, vol. i., p. 132; vol. 2, p. 109.

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spheroidal embryos by the differentiation and multiplication of the cell. The marrow-bone is at first pointed at both ends, as in the brainless and skull-less lancelet (amphioxus); in other vertebrates the front end is changed into brain. At first the extremities of the different classes are hard to distinguish. Gills are the beginning of the breathing organs. At first all fishes have an heterocercal tail like the shark. Recent observations on the embryos of sharks show that the fins develop from the post-oral parts. The beginning of a tail is perceptible in the human embryo, nor are the *cilia* wanting. Several rudimentary organs (*e.g.* the pineal gland, six or seven fingers, bones in the hand and foot) are a memento of primitive times. In animals, including reptiles, birds, and mammals, certain characteristics (*e.g.*, spots, longitudinal or cross stripes, &c.) frequently succeed in order in individuals. Are these really heirlooms from the distant past? Is this successive ontogenesis a revival of conditions that had long been in abeyance? Is ontogenesis a second edition of phylogenesis, or race history? We are weighing the facts of ontogenesis, just as we dealt above with the facts of palæontology. The facts are correct, but the explanation is arbitrary. In autogony we have to do with an actual development of a living germ which cannot be explained in itself, but which is essentially bound up with the question of life. A fact in itself inexplicable is ill adapted to prove the history of a race that no longer exists, and that has left no foot-prints behind it. Barring monsters which betray the presence of other influences, every embryo, unshackled in its growth, constantly develops according to the species of the parent. This circumstance militates against successfully applying ontogenesis to phylogenesis. No embryo can live that has not mounted this step in the ladder of development. Neither bird nor fish ever issued from a mammal embryo, nor has a human mother ever given birth to a beast. It is only a question then of inheriting small changes in themselves inexplicable. These changes, however, are referred to other causes only by the law of

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correlation, according to which different organs (*e.g.*, antlers, hair, sexual organs) are modified in the same way. Rudimentary organs that serve no ostensible purpose (*e.g.*, the vermiform appendage to the alimentary canal, divided toes in the horse, teats in males) and the pedigrees restored by palæontology (*e.g.*, in the hoofed beasts) may be easily set down as legacies bequeathed from the remote past. It has even been attempted to apply this biogenetical law to lower living forms in order to explain those phenomena amid which the principle of utility leaves the enquirer in the lurch. Pointed reference seems to be made to the ammonites of the Jura, because in no other class of animals do we see the evolution of the external form *ab ovo*, *i.e.*, from the very beginning of the cell.[14] There is, however, no escaping the glaring *petitio principii*. Descent is unexplained, and yet it is proferred as an explanation of inheritance. Ontogenesis itself is a mystery. Its application to the history of species has no value beyond that of analogy. Even the analogy is faulty because it has to be established in the first instance by falsifying the nature of ontogenesis. Method may be the gainer by the transaction, but the principle and method of science should not be confounded with the principle of existence and growth.

Inheritance, moreover, is narrowed within the same limits as variability. Only that which exists can be inherited. Inheritance is a result, not an agent. Like the principle of variability, it hurls defiance in the teeth of those who would explain it. Inheritance is a mechanically inconceivable quantity—"one of those words which by reason of their simplicity and clearness are admirably designed to throw dust in the eyes of the unwary."[15] Haeckel himself, by taking refuge in the "memory of plastidules" and in the "unconscious memory of living matter," thereby acknowledges that the phenomena of inheritance and propa-

14 Württemberger, *Ausland*, 1873, No. 1. *Natur und Offenbarung*, 1884, p. 503, seq. Schlichter, *Württemb. Jahreshefte*, 1885, p. 95, seq. In the same periodical, 1882, see Eimer, *Ueber gesetzmässige Zeichnung der Reptilien*, *speciell der Eidechsen*, p. 114, seq. *Ueber die Zeichnung der Vögel und Säugthiere*, 1883, p. 56, seq.

15 Max Müller, *Essays*, Vol. II., p. 494.

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gation cannot be explained mechanically. How can inheritance by a mechanical, chemico-physical process, reproduce in the individual the gradual unaccountable accumulations of an endless succession of former races? Not even Nägeli's idioplasm can rise to the height of accounting for it. For its vertical and horizontal growth needs setting on a physiological basis. If its slight variations are at first latent and are only visible after attaining a certain tension, it will be necessary to prove physiologically a law of perfectibility as well as a strict law of inheritance. Idioplasm can give no reason for the pranks played by inheritance, and itself outstrips the law of inheritance in its amazing power of reproduction. There is no alternative but recourse to a certain "sense" of the various dispositions of the idioplasm. The dynamic influence is indispensable both for ontogenesis and phylogenesis.

The element that gives a character to the Darwinian theory of descent is the principle of natural selection in the struggle for life. Here we have the real basis of the facts that variability and inheritance bring to light. It accomplishes in nature what the gardener and cattle-breeder compass by means of artificial selection. Nay, its action is even more widespread. For domestication does not travel outside the species on which it operates. But natural selection has an indefinite period of time at its disposal, and breaks down every barrier by its progressive accumulation of small steps. The very phrases "natural selection" and "struggle for life" have acted like a magic wand, and given a fresh impulse and aim to the entire study of nature. Look where we will, everywhere the struggle for existence is raging. Plants dispute the soil with one another; they battle with heat and cold, and engage in strife with the elements. Water-plants, when the waters retire, grow on the sea-shore, and sea-shore plants make themselves at home on the land. The plant that grows on the mountain keeps close to the ground, and has a coat wherewith to protect its leaves and stalks against the cold wintry blasts. When transplanted into the plain

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it is free to spread out its organs in order to enjoy to the full its share of air and light. Animals, too, are ever at war with nature, climate and the elements. Land-animals and water-animals, each in turn, have to do battle with the fickle elements. Not even the nests of birds are spared. Hence those organs are the strongest and most frequently in action which have to cope with the elements and lend themselves to circumstances. Fins are best suited to the fish, wings to the bird, and feet to the animal. For breathing purposes, gills answer better in water, lungs on land, and so on, with the other organs of sense. Conversely those organs deteriorate which are less easily adapted to new circumstances. A change in the elements will consequently retard their growth and cause them to degenerate. When insects are driven on an island, their wings are their destruction. If they are bold enough to try their power of flight, they are in danger of being blown into the water. Those which sauce their valour with discretion will have the best chance of surviving. The more prudent they are, the less they will use their wings. Then by degrees the wings are shrivelled up and refuse to do their work. They are no longer equal to the task of flying, but the rudiments that remain prove that the wings formerly existed. In the common *procrustes coriaceus* there are veined rudiments of wings, and shell-like wing-covers which have grown into each other, but easily divide at the seam which still remains. Many beetles are in the same category. The eyes of animals that live underground, the mole for example, have fallen into disuse. The eyes of the *proteus anguineus*, found in the Adelsberg cavern, are under the transparent skin: it has also lungs and gills. Is not this a case in point of deterioration brought on by disuse? May not the same be said of the back toes on a horse's foot? of the pineal gland? of the teats of males? and of many other rudimentary organs whose functions have ceased?[16]*

* Such organs are technically described as "dysteleological."

16 Dahl, *Die Nothwendigkeit der Religion, etc.* Heidelberg, 1886—Zacharias, p. 41. *Polybiblion*, Paris, 1885, p. 392—*Unser Wissen*, p. 732—Bastian, *The Brain as an organ of Mind*, 1881.

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Animals likewise make war on one another. They not only compete with one another for the possession of food, but they devour one another. They go in search of prey, and employ craft and violence to catch it. The less there is to plunder the more determined are their efforts, and the more likely are the small and weak to fall into their clutches. The stronger and more cunning the animal the greater its chance of passing safely through the struggle for existence. Conversely, the marsupials most noted for being cunning and swift of foot, have least difficulty in escaping the beasts of prey. Thus the animals whose organs of offence and defence are most perfect will be best able to survive and multiply. The prolonged struggle, on the other hand, will cause the organs most adapted for pursuit or flight to be largely developed and transmitted to posterity. The antlers of the stag, the horns of cattle, the horses' hoofs, the teeth and claws of beasts of prey, the long feet of the roe and hare, the piercing eye of the bird of prey are instances in point. But the means of defence are not yet exhausted. The insect that is coloured and shaped like a leaf or flower is less easily detected by the bird. The bird that has the same colour as its surroundings in field and forest, and the hunted animal that resembles its place of resort are already strongly protected against hostile encroachments. Suchlike phenomena are of frequent occurrence in nature, as anyone can see for himself by a little painstaking observation. He has only to compare the insect with the plant on which it feeds, and to note that the colour of the birds of the field is grey, and that of the animals of the wilderness sandy, to be quite convinced that mimicry does play a part in the struggle for life. The colour even varies with climates and seasons. Nay, it is even pretended that the longitudinal stripes of the old animal world were protective because they agreed with the lines of the monocotyledon flora, and furthermore that the transition to spots is connected with the origin of dicotyledons, the shades of which are spotlike. What more natural than to treat these phenomena

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as resulting from natural selection? The individuals least favourably coloured were the first to fall victims to the pursuer, and in the end only those survived whose colouring was in harmony with their environment.

These facts have, undeniably, a certain force. Still it must be borne in mind that we are examining a theory which professes, without empirical proof, to explain the present order of nature as the outcome of a development produced by the struggle for life. If our criticisms of variability and heredity are correct, natural selection and the struggle for life are inadequate to account for the entire gradation of fauna and flora, and to trace all animals to a common type, and all plants to a few tiny specks floating in water. Nothing short of omnipotence would be required to make animals, cast on shore, grow accustomed to life on land, or to form the original animals cast ashore into birds, and make ichthyophagi cleave the air. It is taxing the resources of the sea-shore too heavily, to make it responsible for the great divisions of zoology.

Let us now subject this fundamental principle of Darwinism to a more searching scrutiny. In effect it may be summarised as follows: What is useful is preserved and improved in the struggle for life: What is useless or hurtful perishes or deteriorates. Mr. Herbert Spencer's phrase, the survival of the fittest, puts the matter in a nutshell. But, at the outset, a serious difficulty presents itself which is calculated to shake faith in the principle. The lower, imperfect animals, with which the graduated scale begins, fit very badly into the theory of selection. The utility of natural selection and its biological adaptations are out of place in creatures uniformly similar. What reason can there be for the formation of higher organisms which are in no way needed? Then, there is another difficulty which recurs at the beginning of every fresh organ. The lower organisms have not disappeared. Far from it; for they exist in countless myriads side by side with more highly organized beings. The first change is effected within a very narrow compass. How then can it be of service in

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the struggle for life? The beginning of an eye is not adapted for sight; the beginning of a horn is valueless as a defence; the beginning of a tail serves no purpose under heaven: they are therefore meaningless in the struggle for life. Utility, therefore, is the cause neither of their origin nor of their inheritance. If the variety were accidental, it would be lost by crossing before it could become useful. It would be far more plausible to plead that animals, with no organ of defence properly developed, had used some existing organ for defensive purposes. Thus the flathead or monk-stags have nothing in the way of antlers but lumps overgrown with skin; but they use their fore-feet to such advantage that, as a rule, they win a victory over their horned suitors. Maybe the antlers are developing by slow degrees, but the evidence is not forthcoming. Although the struggle has been continuous, the beginning and the transitions are nowhere to be found. If the different species had really arisen and were still arising solely through repeated selection in the struggle for life, the forms of the two organic kingdoms would necessarily be blent in such vast confusion that all attempt at systematic grouping or division into genera and species would be pre-doomed to failure. But the precise contrary is the case. This fact alone suffices to brand natural selection as inadequate.

Mechanical stimulus, as Nägeli calls it, is something over and above the survival of the fittest, but it is equally unable to explain the disposition for a new organ. It is best confuted by the fact that mechanical means have never succeeded in producing a new organ either in the human or animal body. Corns certainly prove nothing to the contrary. Why should the reaction of the epithelial cells on the continued stimulus in former times be different from the present reaction? The eyes of insects are, in their construction, most artificial. Imagine the power of mechanical stimulus that would have been needed to conjure up thousands of facets! Our best diamond cutters might here profitably take a lesson. The eyes are, it is

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true, immovable, and must therefore be spread over a larger surface. But why has this class retained immovable facet eyes, when its development has been in other respects in proportion? A few eyes suffice for the spider. Why would not a few suffice for all? Neither does adaptation help us over the difficulty. The origin of the eye is clad with mystery, and Leydig, Ranke, Zacharias, Spencer and Bastian do not pluck the heart out of the mystery by contending that the eye, like the other senses, is but a differentiated sense of taste, which is a means of seeing but is not ordained for seeing. Not even adaptation can tell why an eyeless animal is transformed into an animal with eyes. We are utterly in the dark as to how a cluster of epithelial cells can be converted into an organ adapted for the perception of light. Talk about adaptation between skin and sunlight! Why, then, is the eye formed only in certain parts of the body? Why is the eye so strikingly symmetrical in its whole organization? The same may be said with truth of the other organs, but the differences are not so strongly marked. No reason can be given, for instance, why ruminants have horns nowhere but on the head; why the horns are only two in number, and why other animals have no horns at all.

The organisms and organs in nature must have been arranged in mutual harmony and correlation from the very beginning; they must likewise have been adapted to their environment at least to the extent that they could easily exist and be brought into action. The adaptive characters, too, must have reached a certain stage of development before they could be useful. The organization of the several individuals is perfect and to the purpose; they are even better equipped than man.[17] The trilobites of the Silurian strata, it is said, were not provided with such a perfect outfit as the later crabs; but the assertion is backed by no proof. Equally unfounded is the statement that the saurians of the Jura were less adapted to their environment

17 S. Augustine, *De nat. bon.*, c. 8—Storz, *Philos. des hl. Augustinus*, p. 234 seq. Secchi, *Schoepfung*, p. 26. Nägeli, p. 14.

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than the modern lizard. The bird is certainly more highly differentiated than the earth-worm, but it fulfils its office in life no better, nor is it better adapted to its conditions of life. Every organism in relation to its suitableness for its aim in life is equally perfect. In this respect the one-celled plant is as perfect as the apple-tree, the radiates as the lion. A more perfect adaptation is neither necessary nor useful. In a larger class, viz., the Ammonites of the Jura, we find a series of minute variations that are apparently of little or no utility. These Ammonites can be traced in regular succession from the under Lias to the upper White Jura. The size of the shell, the number of coils, the formation of the skeleton, the division of the ribs, the branching of the lobes and the like offer interesting points for study of variability and inheritance. But how can it be shown that one or other of these properties, or all of them together, have rendered substantial service to the animal in its struggle for life? Did perchance the Ammonite in the Jura Sea with its inflated back and rich rib formation find and retain its food more easily than the later compressed Ammonite which has no ribs at all and an angular back? It is well-known that the *Ammonites Capricornus* is smooth in youth; in middle life it is covered with lumps which again disappear in old age. What can the principle of utility have to do in this matter? But, it is said, all coexistent organisms mutually strive to attain an ever-increasing height of perfection. Consequently all the organisms that come forth together are equally highly developed. Whether they be highly organized mammals or simple globules of protoplasm they must have advantages to counterbalance the advantages of other animals."[18] The pike in a carp pond is an instance in point. As soon as there is a notable decrease in the number of carp, the rations of the pike are cut down, and in consequence there is a heavy fall in their muscular strength. On the other hand some few pike find good food, increase in numbers, and are again benefactors to their species. Cir-

18 Dahn, p. 24.

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cumstances are in no way materially changed. Pike and carp again recover their equilibrium. Many similar instances, some even more striking, could be given. It will, however, suffice to mention how destructive insects and their foes hold each other in equilibrium. The bees that fertilize the clover in the meadow are chased by field mice. The domestic cat, the raven and the crow persecute the field mice, and thereby promote the welfare of the clover. The efforts of bees and mice, of cats, crows and clover are all directed to preserving the balance of power. In an enclosed carp-pond the pike might easily destroy the carp root and branch, especially if the stronger pike drove off the weaker and then united their forces to make a common onslaught on the few remaining carp. The disappearance of entire families and species is not unusual in the history of animals. Trilobites and ammonites, belemnites and saurians of the Lias, bears and mammoths, and many others have been swept off the scene. When America was discovered, not a horse was to be found throughout the length and breadth of that vast continent, although palæontology has since unearthed its remains. Nevertheless, it must be granted that whole classes are not so rapidly annihilated in the struggle for existence ; there is a certain balance of power subsisting between beasts of prey and their victims. What bearing has this fact on natural selection ? Plainly, that each animal must have been perfect in its kind from the very beginning, and hence the reason of serial succession lies elsewhere. The lower animals of to-day are not one jot or tittle better or more perfect than their ancestors, as the globules of protoplasm abundantly testify. That mutual impulse to higher perfection, of which we were speaking, is neither actively nor passively suited to the lower animals. At any rate the improvement should be mutual, whereas selection cannot but make it one-sided. If mutual influence is at work in the present, it cannot have been dormant in the past.

We have not yet, however, reached the limit to which equilibrium and mutual accommodation stretch. They

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extend to the animal kingdoms in the mass as well as in the individual. Animals, it need hardly be said, feed on plants. But the conclusion from this fact has still to be drawn : Plants exist for the sake of animals. Palæontology now steps in and proves that animals and plants come on the scene about the same time. Here we will call attention to some of the special circumstances attending this mutual dependency. Insects, as is well known, live for the most part on the flowers of plants, and many insects are restricted to certain particular plants. The Larvæ require special leaves which the butterfly knows exactly where to find. If these leaves cannot be had, because the tree is injured or the buds are frost-bitten, the caterpillar will die out. The same result will ensue if the caterpillar is transported to a country where these leaves do not grow. It never occurs to them to try and accommodate themselves to other kinds of leaves. Now, is it at all probable that caterpillars would have cut off their supplies by gradually accommodating themselves to certain plants to the exclusion of others ? Surely selection should have widened, not narrowed the supply of food. For experience teaches that those fare best who are least selective. Thus insects have certain plants for their dowry. Another equally curious fact, only recently discovered and appreciated at its true worth, is that insects do good to plants.

In a large number of plants the male and female flowers are distributed on different individuals (*diœcious*), or on different branches of the same plant (*monœcious*). For this reason neither of these two classes of plants can immediately fertilize themselves. By a wise provision of nature the grains of pollen are, as a rule, blown on to the stigma by the wind ; but in many cases this device is hardly sufficient. In the hermaphrodites too, either the stamens and pistils mature at different times (*Dichogamy*), or the structure of the plant is such that the pollen can fall out of the anther on the stigma only with great difficulty, if at all (*Heterostyle*). In some flowers the style is longer than the stamens, or *vice versa* (*e.g.* the dimorphic *primula officinalis*

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and the trimorphic *Lythrum Salicaria*). In these cases fertilization is legitimate, if effected by organs that are equal in height; that effected otherwise is illegitimate and frequently sterile. Insects coming in quest of honey and pollen do the work of fertilization. They can easily deposit the pollen on the stigma, because the shade of the perigonium is usually such as to compel the insect to strike the anthers while reaching its food. This fact is well illustrated in the case of the orchis and asclepias. As a rule certain insects are partial to certain plants (*e.g.*, humble bees to clover), because the organization of each is suited to the other. Still it is generally true that insect-fertilization is necessary as a means of cross-fertilization. Nothing can be clearer than that many plants have a natural disposition for developing in their flowers contrivances that make self-fertilization very difficult. If this is so, surely the animal world must have been ordained for this office. There is no reason for supposing that the disposition was different in former times. As long as the psychic element is ignored there is no explaining how the dimorphic or trimorphic arrangement can have arisen from abhorrence to self-fertilization. It is nothing to the purpose to plead that the majority of hermaphrodites are equal in height, and that stamens and pistils of equal height are the most favourable to fertilization. It is equally unlikely that the organization of insects was in the first instance owing to corresponding contrivances in plants. Thus it is improbable that the proboscis has been developed by extracting honey from the nectary of the flower, and that, conversely, the flower has been altered in form by the proboscis. Nor yet again is there any probability in the suggestion that insects are attracted by the scent and colour of flowers, and therefore the propagation of the most beautifully coloured flowers is ensured. We will not here repeat the question as to the first commencements of the proboscis and calyx, which must have been adapted to one another at the outset. We will not dwell on the circumstance that insects do not uniformly frequent the most

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beautiful and the most fragrant flowers, as colour and smell have but slight influence. But for this reason we are entitled to lay all the more stress on their mutual adaptation. The insect depends on the plant, and the plant on the insect, and their organizations are shaped to meet the requirements of this mutual dependency. The nectary secretes the sweet juice of the flower, and the bee gets at the juice with its proboscis. Is it not just as likely that the nectary was ordained for the bee, and the bee for the nectary, as that nectary and proboscis have mutually developed each other? The first alternative is a fact, the second a theory. Here also selections would be one-sided, and could never explain why development has come to a standstill. The separate development of proboscis and nectary would destroy the adaptation, and hence be harmful; selection, on the other hand, will never be able to account for simultaneous development. If, as the mechanical doctrine of descent teaches, the repeated application of the stimulus of the insect has caused the leaf to grow, and the leaf has, in turn, stimulated the growth of the proboscis, some proof from experience should be forthcoming. Those who maintain that both flower and proboscis are limited in development, *ipso facto* shake the dust of the empirical explanation from their feet. And further to limit this limitation to certain species would be equally strange.

Still more surprising is the universal adaptation of the plant and animal kingdoms to each other. They are not only in many ways ordained for each other, but the same fundamental conditions are requisite for the life of both, —light and air. The animal breathes oxygen, the plant a corresponding quantity of carbonic acid. Conversely, the animal exhales carbonic acid, the plant, oxygen. Thus a brisk invisible trade is ever going on between the two kingdoms. But the imports and exports are so well-regulated that the percentage of nitrogen, oxygen and carbonic acid in the air remains the same throughout, and thus life continues to thrive. Each process fosters life in both

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kingdoms. By the influence of light the kinetic energy in the plant becomes potential, and *vice-versa* the potential energy in the animal is made kinetic. Did the struggle for existence first create this equilibrium? The coal-measures are alleged in proof, because they suppose an atmosphere strongly charged with carbonic acid, and the lower animals, water-animals almost without exception, need but little oxygen. But, on the other hand, the advanced vegetation would have caused a prodigious discharge of oxygen. So the difficulty of an unstable equilibrium still remains. The conclusion, then, is that certain fixed relations must have been established between the two kingdoms from the beginning. It is for Teleology to draw further conclusions. But the question as to the utility of organs is far from being exhausted. In this connection the vegetable kingdom deserves special consideration as it, least of all, fits into the Darwinian scheme. The most formidable opponents of Darwinism are botanists. Wigand thinks that this theory would never have been propounded, if the vegetable kingdom had been duly considered by its authors. The Monistic Nägeli has forcibly shown how miserably insufficient is Natural Selection to account for plant life.[19] The morphological characters of plants are the least variable. They are very important for the system but wholly useless to the plant. The plant may be whole or divided, feathered or plain, sawed, notched or toothed, circular or oval, kidney or lancet-shaped; the leaves may be front to front, or back to back, or crossed; the petals may be three, four, five, or more in number; the positions of the flower in relation to the female pistil may be hypogynous, perigynous or epigynous; all this and much more is of the highest morphological importance, but of no appreciable physiological value. It is hopeless to find an explanation of the origin and inheritance of these morphological peculiarities in natural selection. To take refuge in former unknown utility is the merest quibble. A theory that confesses its impotency to account for the commonest phenomena in the

19 See *Sieben Gründe gegen den Darwinismus; Abstammungslehre*, p. 290.

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vegetable kingdom, is condemned out of its own mouth. We grant that "the most tenacious morphological phenomena in which no appreciable advantage or purpose is describable, are as a rule inherited." But this fact is not accounted for by saying that former living beings "could with advantage have acquired this organization."[20] This is a mere jingle of words, not only without proof, but also illogical and at variance with experience. Thus it is no rhetorical exaggeration to say that all botany is up in arms against the doctrine of descent. The vegetable kingdom both past and present is equally stubborn and unyielding in its resistance. Its strictly morphological character is proof against all assaults. Plants are very properly classed according to structure, food and locality. The chalk plants are usually bluish-green and hairy; the leaves are more deeply divided or sawed; the flowers are generally large; but the colours are dull. The flowers of the flint plants, on the other hand, are smaller but brighter; the leaves are grass-green with the rim either slightly toothed or quite even. These differences, however, do not always occur. Moreover their origin through external causes is doubtful, because plants from the chalk and flint formations are strictly tied down to the soil. Anyhow the utility of such slight morphological differences is not proved.

Moritz Wagner was so overpowered by the difficulties that beset the theory of selection, especially the contradiction between variability and inheritance, that he was emboldened to float a new hypothesis.[21] But, in presence of the manifold diversity of living forms, his migration theory is equally impotent. It supposes what is scientifically impossible, and in this way serves to show the untenableness of the theory of selection. The fauna and flora of South-Western America, South Africa, and Australia are very

20 *Unser Wissen*, p. 703—21.

21 L.c. p 702, seq. M. Wagner in the *Augsb. Allg. Ztg.* 1873. *Beil.* No. 317-320. Eimer, *Württemb. Jahreshefte*, 1883, p. 78 seq. Dixon, *Evolution without natural selection, or The Segregation of Species without the aid of the Darwinian hypothesis*, London, 1885.

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different, although the conditions under which they live are extremely similar. Even on the two coasts of South America the difference is considerable. The ornithological, mammalian and other fauna of America have striking peculiarities, as seen, for instance, in the green parrot, the long bill or pepper-pecker, and the colibri. Pachyderms are represented by the tapir, camel, and lama. Apes are now classified as apes of the old and new world, or as small-nosed and flat-nosed (Catarrhine and Platyrrhine). Clawed apes belong to South America, semi-apes to Africa. The edentata are very feebly represented in the old world. America and Australia are the home of the sloth and armadillo. The strange ornithorhynchus or duck-bill inhabits New Holland. One species of the edentata, the scaly ant-eater, is especially interesting, since according to recent researches it supplies the missing link between mammals and birds, and thereby forms a pendant to the mysterious archeopteryx that has been discovered in the Oolitic slates of Solenhofen.[22] Quite recently, however, Dames has shown that it is a genuine bird of the *Carinatæ* class. The ant-bear is the only mammal at present known to lay eggs. It digs a hole, fences it round with leaves and twigs, and therein makes its nest. The eggs when laid are in an advanced stage of development, and need no hatching. The young live before their birth on the yolk of the egg. Marsupials are found nowhere but in America and Australia. The kangaroo is peculiar to Australia; it is the Australian substitute for the ruminants. America and Australia are not less rich in special kinds of plants which, particularly in Australia, are often abnormal in their formation (*casuarines*). The deposits in the tertiary beds lead us to suppose that isolation has been mainly instrumental in preserving till now these relics of the tertiary period. Similar phenomena, though not on so grand a scale, may be observed in other parts of the same

22 See *Natur und Offenbarung*, 1885, p. 189, seq. The Archeopteryx. See *Ausland*, 1871, No. 14, *Natur und Offenbarung*, 1886, p. 1761—*Unser Wissen*.

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continents. Hence development might be due in great measure to isolation or separation.

But it is not all plain sailing. There are rocks ahead, on which the migration theory will inevitably strike. For the isolation was not complete and constant, nor was crossing excluded. On the contrary, changes were not infrequent. The earth's surface had its full share of changes. Lofty mountains and spacious plains, cold winds from the north and warm winds from the south, the ice-age and the deluge have had a hand in the formation of isolated areas. They joined islands to the mainland and separated the mainland from the sea. Thus complete isolation is a dream. Then, again, what would be the special effect of separation? Surely to preserve not to change existing organisms. Change of locality cannot be a more powerful factor than the struggle for existence. Nevertheless some plants (*e.g.* Alpine roses), notwithstanding changes in locality and circumstances, have remained unchanged since the glacial epoch. The rules as to local modifications are as fixed and as fickle as laws relating to the weather, being honoured more in the breach than in the observance. The influence of food and climate is not strong enough to produce permanent characteristics. But Darwinism was still reeling under the reproach that it applied the laws of artificial selection to a free state of nature. The migration theory was invented to parry this thrust. Separation, it contends, is Nature's substitute for the breeder's art. But it gives no deeper insight into principles, nor does it pluck up by the roots the difficulties that are ever cropping up anew. As the first colonists vary but slightly from the parent type, the only course open to them is to retain the parent type. If they largely increase and multiply, or if there is an influx of new colonists, we must fall back on the theory of selection.

Estrangement, not change, is the goal of separation. It is matter of recent observation that animals, which were transported many years ago from the Old to the New World or *vice-versa*, guinea pigs, for example, will no longer

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pair with individuals of the same species, and in this fact the transmutation theory is supposed to score. Alas, the way is wearisome and long from this estrangement to a new species. A substantial change has not yet ensued. It was also noticed that the axolotl (*Siredon Lichenoides*), when in the aquarium, discarded its gills. Forthwith a rush was made to the conclusion that the change was owing to changed conditions of life. It has, however, been since ascertained that axolotls thus metamorphosed abound in the neighbourhood of the Mexican Gulf. Thus the reason of the change lies not in the circumstances but in the species, as is the case also with the frog. Different breeds of dogs are often estranged from one another. But here the certain difference in race comes to our aid. Hence European cats and guinea pigs will not pair with those of South America, nor the European rabbit with its descendants in Madeira.[23] The migration theory may, in truth, throw a flood of light on the unequal geographical distribution of organic beings, but as an element in the theory of evolution it is almost sterile. There is a notion abroad, which gains in strength and probability day by day, that the fauna and flora gradually spread over the earth from the North and South Poles. Still it might be rash to argue from this to a single original creation by which the world was gradually peopled. For, however scanty our knowledge of the greater part of the earth may be, it is quite certain that the highly organized animals were late in appearing on the scene. Every species of animal and plant has appeared once only, and that in its own centre or area; but all did not appear at once. Migration has changed much, and separation has retained much; but the entire race has not been evolved by these two agents, nor has it been spread broadcast by migration. Isolation may tell favourably on the formation of species, still it has no more right than the rival Darwinian principle of utility to be considered the most essential or, as Wagner will have it, the only cause of the origin of species. Nay, the very fact

23 *Unser Wissen*, p. 693—*Polybiblion*, 1885, p. 391—Schaaffhausen, p. 143.

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underlying the migration theory, namely the existence of different fauna and flora, proves that no internal power of transmutation (*Idioplasma*) is present. It would be necessary to suppose that the principle has been working so slowly and so silently as to leave no visible trace for several geological epochs. This, however, is to withdraw the case from the jurisdiction of science. There's small choice, as the saying is, in rotten apples; still, if the choice lay between the two, preference should be given to Eimer's genepistatic theory, according to which the origin of species rests on the permanent forms which living beings have acquired in the various degrees of natural development. Every species would then, at least, be circumscribed within definite limits.

Thus natural selection, neither alone nor in conjunction with any other purely external cause, can account for the many various forms of life. The objections urged by Wagner, Wigand, and Nägeli forced Darwin himself to admit that he had attached too much importance to natural selection.[24] He therefore supplemented his theory with sexual selection.* Mating for breeding purposes is common among many of the higher genera of animals. As the sexes are distinguished in the later formation of the embryo, the distinction into sexes must be due to sexual selection. Sexual selection operates in two ways. In their rival struggles during the breeding season the secondary sexual characteristics of the males serve as weapons of attack and defence. Such are, for instance, the horns of the stag, the spurs of the cock, the huge mandibles of the stag-beetle, and so forth. Other secondary sexual characteristics are useful for attracting the female. To this latter kind belong the glandular sack of the musk-deer, the rich plumage and sweet singing of many birds, the mane of the lion, the goat's beard, and the like. As the strongest and best-armed males get possession of the females, and as the

24 *Abstamm.*, Vol.. I, p. 132, 225.

* Mr. Herbert Spencer has now declared that all these are insufficient. See *Nineteenth Century*, 1888.

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preference is given to the most beautiful in the case of both male and female, the strongest and most perfect individuals are mated, and leave a strong and goodly offspring.

Sexual selection, however, takes for granted that these secondary sexual characteristics always exist. Now, as a rule, this is true only in the higher genera, and even here the two sexes often share these characteristics alternately. But there is absolutely no foundation for the theory in the case of the lower animals, with whom, be it noted, evolution should begin. Here the secondary characteristics are either quite unimportant or barely perceptible. The pairing is almost casual,—just as the sexes chance to meet. The physiological act of reproduction, however, in spite of its gradations, is so essentially similar in the entire animal kingdom that no principle can be found elsewhere to explain it. The origin of these secondary characteristics is quite as problematical as the origin of new organs. Before they can take effect they must have attained a certain measure of progress in their formation. Again a sufficient reason for the first beginning is wanting.

Their existence being granted, it is still very doubtful whether they have played a prominent part in animal development. The selection of the males by the females is more in the nature of a hypothesis than that of a fact. It is, however, correct that the females, especially in certain families of birds (*e.g.* gallinaceous), owing to their small size and dull colouring, are exposed to fewer dangers in the struggle for existence than the males, who, in form and colouring, are more strongly marked. As a rule youthful characteristics cleave to the female, whose development, therefore, remains on a lower grade longer than that of the male (Law of male preponderance). Consequently, according to the law of the struggle for existence, males, like white ravens, should long ago have vanished off the face of the earth. It would, indeed, be surpassing strange if sexual selection exposed them to greater dangers by reason of their charms and ornaments, while natural selection was arming them against these dangers. Anyhow the

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selection of the female must be limited to a few males. But the females are perfectly passive. During the fierce struggle between the rival males they look on in unmoved and listless indifference, shewing favour to neither combatant, not rejoicing in the triumph of the one nor sorrowing over the defeat of the other. The battle over, they march off with the victor, unresisting, not consenting. No physical or æsthetical considerations enter into the bargain. If, as was said above, the theory of natural selection was hatched in the dovecote and the stable, that of sexual selection may be said to have been excogitated in the family parlour. It applies human ideas to animals, with the important difference that mankind regard the female as the sex of beauty and the object of selection. This fact should have saved Darwin from the pitfall. Besides, all the lives of animals, down to the minutest details, are developed according to fixed and absolute laws, and this simple fact tears into shreds the notion that animals are fascinated by gorgeous colours.

In the vegetable kingdom sexual selection is without aim or purpose. There are, it is true, secondary sexual characteristics at work among some orchids, and in the flowers of the cupulifer and betulaceæ (oak, birch, hazel-nut, alder), which are dissimilar in formation. But of sexual selection there is not the faintest glimmer. It is an impossibility. How then can the organs have originated from it? As it cannot even explain sexual differentiation in the vegetable kingdom, how shall it account for the evolution of the whole? Even in insect fertilization the secondary sexual organs are unimportant. The strongly marked properties of flowers in size and colour are dependent on the perigonium. Thus the sexual organs are relatively insignificant.

Secondary sexual characteristics are, therefore, proved to be founded on sexual organism. Some are correlated to the whole disposition. Castration brings about a great change in all. Hence these characteristics are developed in direct proportion to the activity of the males in the

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breeding season. The enormous vital energy displayed in movement, song, and foolhardy passion cannot but quicken physiological activity. This may have caused and intensified the bright, beautiful colours of male butterflies.[25] Still there are well-defined limits to their action. Moreover if we pass from the attractive to the indifferent males we find that these latter are by no means rare (*e.g.*, whitings; black beetles). As the altitude of the locality tends to produce intensity of colouring in plants, so it probably exercises a like influence on insects, molluscs, and other animals. Even if sexual selection were so far-reaching in its consequences, the proportion of sexes, which is a constant and regular quantity, would still be unexplained. Selection does not alter this proportion even among mankind, in whom it undoubtedly exists. It is computed that the proportion between male and female is as 28 to 29. There are 105 births of boys to 100 of girls. On the other hand 155 boys die in the first year, compared with 100 girls. Such regularity would be more than curious if the differentiation (which sets in late) were, so to speak, dependent on the shot of accident, or the dart of chance. What an untrue compass chance is for measuring the regular course of the processes of nature! Unless a primitive disposition for the several parental types be assumed, sexual selection and differentiation are themselves hidden in Egyptian darkness, and therefore can throw no light on the dark problem of evolution. The action of external causes is progressive or retrograde; but, unless controlled by organic laws, they can neither perpetuate nor develop the type.

We still stand in the awful presence of nature's mystery. Variability, heredity, adaptation, selection and all such stock phrases stand convicted, both in themselves and in their actual effects, of incompetency to sound the depths and shoals of the sea of organic life. Even in domestication the active cause lies deeper than ever plummet of man sounded. How, then, can we hope to reach it in the bot-

25 *Natur und Offenbarung*, 1886. Nos. 1 and 3.

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tomless ocean of natural selection? The problem attaching to the commencement of new organs and new organisms, and their onward march to perfection, is not pricked even skin-deep by the theory of utility in the struggle for life. Utility, perfection and constancy are three quantities, unlike and unequal. From the very first, classes and orders stand out as well-defined groups. The myriads of alleged transition-forms that one would expect to find, have vanished in the sunbeams. Even if the history of development could tell *how* things have become what they are, the Why and the Wherefore would still be hidden. To allege an endless accumulation of slight variations extending over an indefinitely vast period of time is to appeal blindly to the unknown. All quantitative and mechanical explanations of the qualitative variations in a new organism, or in the differentiation of vegetables as to leaf and axis, or in the determinate formation of an indifferent organ, must be set down as blank failures. No naturalist can point to the origin of a decidedly new species. The theory of descent may present facts in a new light and reconstruct the history of the organic world, but it can never give a satisfactory account of the causes that have made this organic world what it is. At most Darwinism can lift but one corner of the veil. It can, for instance, show how, in the keen competition for life, certain individuals and species have gone to the wall; it can explain how certain rounds in the organic ladder have been broken or removed; but it can furnish no positive clue to the forms of life, or as to why the fittest and most perfect survive. At this point some internal principle must be summoned to the rescue, whether we call it with Schaaffhausen and Askenasy a formative impulse, or with Nägeli a "perfecting impulse." As this impulse of self-forming idioplasm is being pushed stealthily into the groove of mechanical necessity, it is gratifying to hear the inventor of the "Idioplasm theory" confessing that there is not the least foundation for a mechanical solution, and that therefore he does not propose to offer one. Here, then, we may cross the frontier

of teleology. Eimer's confession is also noteworthy. Such absolute regularity, he says, pervades animal forms that he cannot trace them either to immediate usefulness, or to any causes which would gradually transform the organism in a definite direction, independently of the organism itself. Constitutional causes, he thinks, are the essential principle of the transformation of forms. Utility, though a power, can but modify what already exists. With this last statement we can entirely concur. Little as chance has to do with the government of the world, it wholly regulates the transformation of forms.

The theory of descent does not even give a complete history of the organic world. It has not yet succeeded in grouping the facts in regular, unbroken order. Geology and palæontology prove only that, on the whole, there has been progress; but the details are often far from clear. There are some facts, however, which seem to render the alleged progress somewhat doubtful. Thus the lower animals never disappear; only the species change. Indeed, many forms (e.g. Gasteropoda, Acephala) have remained constant since the Age of the Upper Tertiary. Then, again, the highest forms of the previous generation are more perfect than the lowest forms of its successor. The disappearance of species, too, is another drawback. The sea-lion, the dodo, and certain species of the ostrich in New Zealand, the gigantic Irish stag, the German 'Auerochs' have disappeared in historical times without bequeathing their place to a higher species.[26] Many others are entombed in the earth's strata, whose exit from the scene cannot be proved to have been gradual. Darwin himself allows that some (e.g. the ammonites at the end of the Secondary Epoch) were spirited away as if by magic. Often the disappearance is sudden and abrupt; and yet there should be a gradual series in the succession. One generation follows immediately on the other; on its first appearance its outfit is complete, and it is armed *cap-a-pie*;

26 See Schaaffhausen, p. 131. Darwin, *Origin of Species*. Nadaillac, *Die Ersten Menschen und die prähistorischen Zeiten*. *Stuttgart*, 1884, p. 488, seq.

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yet it should have been gradually evolved from its predecessor. Neither existing nature nor palæontological remains supply a clue to the missing transitional varieties. So far no success has waited upon the attempt to prove from palæontology the transition from the fins of the fish to the feet of the salamander. In the lowest petrified strata of the Silurian formation in Bohemia, the so-called primordial fauna include many more highly organized forms (trilobites, for example), in great variety that belong to the crustaceæ; whereas lower organisms, such as coal and lower molluscs, are found only in the upper strata of the same beds. This "surprising fact" is most certainly not explained away "in a very simple manner," by the remark that organic remains in the primordial and Cambrian strata were formed in the deep sea, the fine slime of which accelerated petrifaction.[27] The degenerate eyes of some of these animals may show symptoms of the deep sea; but this does not warrant the conclusion that the blind but highly organized trilobites of the primordial fauna were degenerate forms of fresh-water species with developed eyes, and not the original and most ancient animals of this formation. It is exceedingly improbable that this fresh-water species would have vanished like hailstones, leaving no trace in the chalk and detritus of the low sea-formation. For in other formations (e.g. the Jurassic) numerous fauna of these animals are found imbedded in the chalk. It is a still more improbable fiction that the eyes alone degenerated, while the rest of the body was becoming more highly organized. Other geological epochs present similar phenomena. Doubtless it is pretended that there are certain intermediate extinct forms to hand, e.g. those of the horse, ass, ape (Cœbochœrus, Doliochœrus, Paleochœrus), and of the mammoth, mastodon, and elephant; but they are few and uncertain. If (as is maintained in contradiction to the theory of development in the struggle for life) they were less able to offer resistance and to bear the brunt of the fray, they must have been far

27 Hörner in *Unser Wissen*, p. 719.

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more numerous than the forms that survived. Our knowledge of the local diffusion of organisms in the earlier periods may still be at only a few degrees above zero, but at all events it is high enough for us to read therein that progressive development had ceased in many places. The matter is not simplified by the constant physical change in the habitat, or by the variability of the inhabitants being brought to bear on it. For in spite of enormous changes in these two directions many forms have remained intact since the Glacial or even Tertiary periods. Chronological data may explain when and where different organisms appeared, but they lend no support to evolution. If all the present fauna and flora of earth were buried in the sea, and if a palæontologist of the future were to hold an inquest on them, what would be his verdict? He would decide that the fauna of Australia belong to a much more remote epoch than those of the old world, because the two differ more widely than those of any succeeding formations. Were our palæontological coroner a transmutationist also, with a leaning towards the migration theory, he would without fail seek to derive the higher fauna of the Old World from the lower fauna of the New. Now this imaginary case faithfully describes the position in which modern palæontologists are placed with regard to the older formations. One solitary fact has this defective and broken system brought into prominence, viz., that nature's march has, on the whole, been a progress in perfection. It has no claim, however, to be considered genetic.

The old system undoubtedly compressed the idea of species into too narrow a compass, and was likewise over solicitous about the constancy of species. Even the essential marks of species are uncertain and undefined. A glance down the list of species catalogued since the days of Aristotle will show that the original meaning of the terms *genus* and *species* is lost, because naturalists considered external marks alone as essential. Genus (*γένος*) is the generation; species (*εἶδος*) the outward appearance apart from the generation. When the theory of develop-

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ment stepped forward and proved many of these marks to be of only secondary importance, little was left but the genus. The one sure and safe element in the natural system is a common descent. It matters little whether the individuals are classed as genus or as species. This principle, if applied to the vegetable kingdom, would enable us to disregard the inconstant modifications wrought by food and climate. A difference of species can be recognised only when the distinguishing marks remain constant under similar external conditions. Species is accordingly defined by Quatrefages and van Baer as "a collection of "individuals more or less resembling each other, which "may be regarded as having descended from a single "primitive pair by an uninterrupted and natural succession "of families;"* or by Leunis Frank as the "collection of "those individuals which show no greater differences with "each other than those of similarity of origin." Thus the fact or the possibility of a common descent is proclaimed to be the basis of the notion of species, and mutual crossing is the sign by which we may know it. Crossing between animals that are far removed is difficult. Hybrids both in animals and plants are only slightly if at all fertile, and they easily revert to the parental type. This rule has indeed many exceptions, *e.g.*, hares and rabbits; hens, pheasants and geese; goats and sheep; bulls and zebu; but they are due to the close relationship subsisting between these species. Fertile bastards or hybrids are more easily produced in the animal kingdom, precisely because the variability of the families mostly inclined to cross is so great that distinction becomes very difficult.

Sometimes reproduction can be effected by every part of the individual. In such cases it is hardly a theme for wonder that such overflowing life should assert and preserve itself with tenacity in crossing. Hence the notion of species should not receive a too highly objective colouring; nor, on the other hand, should it be pared down to a mere logical function, or a subjective product of thought.

* Quatrefages, *The Human Species*, London, 1879, p. 36.

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The whole system cannot be banished as a mere abstraction into the twilight of theory. Natural development requires a world-wide area for its operations. Still the blending of a vast multitude of forms in harmony and variety must rest on a solid foundation. To discover this foundation is the work, not of experiment but of philosophy. Filiation is not denied point blank; but it is neither demonstrable nor probable to the extent required by the theory of descent. Scarcely one existing species can be proved to be descended from another. One thing at least is certain: the proof of the correctness of the monophyletic theory is yet to come. The polyphyletic theory alone squares with facts,[28] and therefore nothing remains but to admit a great number of distinct and independent species. It is, indeed, hard to strike the exact mean between Lamarck and Quatrefages, but on this point Christians need not be solicitous.

The main division of the organic world into plants and animals has still to be considered. Till now it has always been thought that the two were divided by the essential difference expressed in the formula: Plants live, animals feel (*plantæ vivunt, animalia sentiunt*). In this pithy statement is boxed up the main-spring of the whole question. Sensation and sensible consciousness are so characteristic of animals, that they alone amply demonstrate that the abyss between animals and plants cannot be bridged over. A certain spontaneous movement is, in a sense, proper also to the lowest types of animals that are bred on rocks. But this is an internal act in nowise analogous to the mechanical movements which contact (touch) produces in plants. The animal desires enjoyment; it runs after things agreeable, and shuns the disagreeable; it is especially fond of pleasure. All these acts betray a sensible perception that is wholly absent from plants; for these last have never to hunt for their food. By a figure of speech we sometimes describe Nature as thirsting and languishing for dew and

28 Nägeli, p. 353 and 468—Polybiblion, 1885, p. 389, and p. 391 on Hybrids. See Schaaffhausen, p. 143.

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rain; but no poet ever personified trees and shrubs in sober earnestness. No animal has a differentiated brain; every animal has a specific alimentary canal, and an aperture. Some, like the amœba, can take in food at any point of the body, and digest it in the empty space. Its whole activity cannot consist in alternate expansion and contraction. Feeling is never wanting; here life is identical with feeling. The feeling of pleasure and pain regulates even the most primitive animal existence. To draw to a nicety the lower boundary line between animal and plant is certainly not easy. Biologists agree that no hard and fast line can be drawn, and that the lowest forms of both kingdoms constantly overlap.[29] But this last contention, be it noted, is not a certain fact, but a deduction born of the difficulty biologists experience in drawing a distinction. It may at times be doubtful in which kingdom the minutest organisms should be classed. Surely, however, it is hardly valid reasoning to argue from this doubt that the two kingdoms have a common origin. Spontaneous movement and sensation are in almost all cases marks of animal organism; whereas the seemingly spontaneous movement of the spores of algæ is explained by the mechanical action of the celia with which they are endowed, however much they seem to resemble the infusoria that have celia. Anyhow no doubt exists as to the distinction in the case of organisms that are more or less developed. It is, however, open to doubt whether cellulose is the material groundwork for the division of organisms into animals and plants. A plant is that union of cells in which the idea of unity is expressed in the correlation of cells to a definite form; whereas an animal is a union of cells in which the idea of unity has found material expression in the nervous system.[30] The plant germ can retain its germinal force for a thousand years independently of external conditions, although its development is essentially dependent on such conditions. The animal germ, on the contrary, dies if its activity is

29 See Zacharias, *Probleme*, p. 78—Dressel, *Belebter Stoff*, p. 55 seq.—Bastian, p. 6.
30 *Gesammtergebniss des Naturerkennens*, 1886, p. 98 seq.

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suspended for a long period. Plants feed on inorganic matter; animals require organic food. In the development of plants, cell joins cell in accordance with physical and chemical laws; in the animal this result is substantially modified under the influence of a guiding principle. Thus animals and plants differ essentially in their beginning and in their development, and their characteristic differences remain throughout constant.

Thus the feeling animal and the unfeeling plant are divided by a yawning chasm, over which nature herself has thrown no bridge. To cross from one side to the other we need a new agency, a specifically distinct force. There is no jumping across. We might be tempted to appeal to the old adage: *Natura non facit saltum.* There are no jumps in nature: but we are mindful that general propositions prove either too much or too little. Naturalists too are divided on this point. Thus one says: "The metamorphosis of plants shows that the great leaps are the most frequent." But these great leaps do not take us to the other side of the chasm. They move in a narrow orbit within the species. They are part of the regular course of nature, and nature guides them in their path to their right end. Of herself, then, nature did not make this wide jump. Neither the conditions of organization nor the ever-active forces of matter could make vaulting nature so overleap herself. Psychic phenomena baffle all physical and chemical laws. The laws of nature do not brook application to psychic phenomena. In this case even the law of the conservation of energy hangs fire. No rack can stretch quantitative differences into the qualitative differences that mark psychic operations. We can examine the movements and material changes that take place in the organs of even those lowest animals whose psychic activity is bounded by the feeling of pleasure and pain; but the sun of science cannot throw a single ray of light on the action of the sensation that has its seat in the soul. Feeling cannot be explained or derived from movement, although itself is a reflex movement. The substance under-

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lying phenomena must be explained psychically as well as physically. Sensation and spontaneity cannot be kneaded into the purely mechanical action of atoms: their two natures are so widely different.[31] It is as difficult to account for psychical phenomena by chemical forces as it is to convert them into heat or electricity. Only the giddy fancy of a giddy spirit can describe them as a secretion in the brain similar to the secretion of the nerves. In the one case the effect is physical, in the other metaphysical. The natures of gravitation, electric attraction and chemical affinity are beyond our grasp, although they are forces moving on the same plane. Atoms and psychological phenomena are incompatible. Mere nervous excitement is no key wherewith to unlock the complex facts of sensible perception. Complex experiences are explicable only by elements of the same order. As such they can be neither weighed, nor measured, nor counted. Here we stand on the upper confines of natural knowledge. In the brain we discover only the movement of material particles. But movement can produce naught but movement in any sphere of existence. A mechanical cause can produce neither sensation nor movement. Science will ever be at a loss to understand how it is that a few atoms of carbon, hydrogen, oxygen, and nitrogen are not perfectly indifferent to the mode or place in which they lie or move. How can their fusion beget sensation? The answer is by no means self-evident.[32] Even Darwin is obliged to acknowledge "that it is as hopeless a task to inquire into what manner the spiritual faculties have been developed in the lowest organisms as it is to inquire about the origin of life. These are problems for future solution if man can ever solve them at all."

The naturalist's only safe course is to confess with the poet:

31 Liebmann, *Analysis*, 1876, p. 255. Pesch, vol. I., p. 535. Kleutgen, *Philos.*, vol. II., p. 297.

32 Dubois-Reymond, p. 29—Huber, *Der alte und neue Glaube*, p. 60. Tait, *Vorlesungen*, p. 20. Tyndall in Zacharias, p. 51 and 68. Herbert Spencer, *First Principles*, 1862—*Controverse*, 1882, p. 738. Darwin and Wundt, vol. II., p. 305.

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O, I am ignorance itself in this!

In discussing the origin of life we criticised the hypothesis of modern psychic dynamism that all matter is animated. Leibnitz sought a mathematical formula for the soul. Haeckel is still engaged in the same fruitless search. The plastidule theory refers the actions of the soul to the material phenomena of motion in the plastic molecules. It is consoling to know that this theory has been set down as unintelligible by its author. Nägeli's theory is but a generalization from natural phenomena. He maintains, forsooth, that life does not begin in man or animal as a new principle, but that the elements of life pre-exist both in the plant and inorganic matter, though in simpler combinations. Still the reaction of inorganic bodies is many miles asunder from animal sensation. Chemical affinity works mechanically, and is measurable; but the life of the soul is incalculable. The requirements of the case would not be met even if it were granted that the inorganic world contains not the dispositions, but only the materials out of which dispositions on a higher scale are welded into instruments of cognition. For new dispositions appear with the organism, and still newer degrees of disposition with the animal.

Theologians are beginning to look upon the Darwinian theory with a more favourable eye. Were it proved, Catholics could accept it without changing a dogma of their faith.[33] Others, especially free-thinking Protestant theologians, go the length of maintaining that Darwin's theory of evolution (which in many points resembles the view of Copernicus) gives a grander idea of God's eternity and omnipotence than the common theory of creation. What can be imagined more magnificent, more sublime, more divine than this principle, beautiful in its simplicity, but bearing the inexhaustible resources of nature in its bosom? To a philosopher the system of many creations seems

33 Haffner, *Katholik*, 1873, No. 1. Heinrich, *Dogm.* vol. v., p. 275. Palmieri, *De Deo Creante*, p. 220. Corluy, *Controverse*, 1885, p. 78 seq. Broglie, *Annales de Phil.* 1887, p. 343. See also Hertling, *Grenzen*, p. 56.

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puerile when set side by side with the theory of evolution. Only people in their childhood, they say, could imagine a special cause at the back of each phenomenon.[34] Catholics and Protestants alike have spoken in a similar strain.[35] They believe that in adopting the Darwinian theory lies the surest way to convince opponents that it does not contradict faith. Darwinism, they declare, is contrary to faith only when it is misinterpreted and misunderstood. Far from excluding a first cause, they say, Darwinism imperatively demands it. My view is not quite so optimistic. I think I have shown that Darwinism would exclude a first cause if it could. By all means let narrow-mindedness be driven from our midst. But the presence of a new force must be recognized in the animal. Thus the first cause is shown to be spiritual as well as living, for it must be higher than the conscious animal. The manifold psychic phenomena we have been considering bring out in all its freshness the truth that in God is life. This result joined with the preceding may be set down as the third stage of the cosmological argument, the transcendent importance of which is not commonly appreciated.

34 Girodon, *Exposé de la doctrine catholique*, Paris, 1884, vol. II., p. 230. *Revue des questions scientifiques*, Bruxelles. See *Controverse*, 1886, p. 300 seq. *Polybiblion*. 1876, 1885, Nov. Schmid, *Die Darwinischen Theorien*, Stuttgart, 1876. Zockler, l.c. differently.

35 Secchi, *Schöpfung*, p. 22, 24, 37. See *Natur und Offenb.*, 1871, No. 9. Gaudry, *Les enchainements du monde animal dans les temps géolog.*, 1883, Polybiblion, 1885, Braun and Zacharias, p. 62 seq. Pfaff., *Schöpfungsgeschichte*, 2nd edit., Frankfort, 1878, p. 349.

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CHAPTER IX.

MAN.

Man is the highest and most perfect of living beings. Following Aristotle, Fathers and Schoolmen defined man as a ζῶον λόγικόν rational animal, an animal gifted with intelligence and reason, a reasonable living being.[1] In weighing him in the balance, however, with other living beings, their comparisons were not drawn to a fine scale. Man, says S. Thomas, is more perfect than other animals. The saint is, moreover, of opinion that intellect does not constitute the specific difference between man and animals since, if it were so, babies would cease to belong to the human family.* Nevertheless their pronouncement that man's superiority lies in his rational endowments is so emphatic that it throws into the shade the physical differences betwixt man and animals. Cyril of Alexandria styles reason man's essential characteristic. Being at once rational and an animal, man is both mortal and capable of knowledge and understanding. In the afore-mentioned compendium of natural science, published at Fulda in the ninth century, man is not recognised as a member of the animal kingdom. Modern zoologists go on another tack.

1 Irenæus, *Adv. Hares.* 5, 1. Cyril, Alexandr. Opp. vol. VI., p. 583, vol. VII., p. 821. See Schwane, *Dogmengeschichte*, vol. II., p. 536 and 546. Storz, *Philosoph.* p. 99, 119, 128. Petavius, *De Incarn.* 6, 1, 8. *De Opif.* 2, 4, 1. S. Thomas, *Summ. Theol.* 1, 30, 2 ad. 3. *Contra Gent.* 2, 59, 7, 8.

* The meaning of S. Thomas in c. 9. II. 59 is that "actual understanding," as distinct from the power or faculty of understanding, does not constitute the specific difference. (Tr.)

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In their classification, mammals are a primary division of vertebrates, and are again sub-divided into animals with toes, with hoofs, or with fins. Animals with two hands stand at the top of the first class; next come those with four hands. The *homo sapiens L.* is the solitary species of the first division. This classification of the lord of animals seems, at first blush, objectionable. But, we are not disposed to quarrel with zoologists, as recent treatises on animal psychology have shown what little advantage accrues to apologetics from judging psychic phenomena by the standard of natural science. As the body is the connecting link between man and the animal kingdom, it seems expedient to begin with the lower part of his nature.

Vegetative and sensitive life is common to man and animals. For this reason man's organization is very similar to that of the animal. The organs and the method of nutrition, respiration, and propagation are the same in man and the higher mammals. Neither is there any essential difference in the action of the senses. Thus, the sense of touch, the yellow speck of the retina, the iris in the apple of the eye, and the ear-lobule, are shared by man with the anthropoid ape.[2] Nevertheless the physical difference between man and the highest animal (the anthropoid ape) is greater than the physical difference between any two closely allied animals. Man's entire build and *habitus* are essentially different from those of the animal. If man was not created in his present fully-developed condition, then he is a product of historical evolution in every organ and system of his complex body, and in the uniform spiritual development that has accompanied the corporal development. In several animals this or that organ or sense is more perfect than in man; but no animal can compare with man's organization as a whole. One chief difference in the entire build is man's erect attitude and gait. "Man alone," says Aristotle, "among living beings "walks with head upright. To make his upper parts light

2 See Schaafhausen, *Anthropol. Stud.*, p. 162 seq. and 428; and p. 306 seq. on Aristotle.

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"and easy to carry, nature removed the weight from above "and placed it below. Hence his thighs and haunches and "the calves of his legs are covered with flesh, and he is "without a tail. The nutriment goes in the direction of "these parts, in order to clothe them with flesh." Aristotle is undoubtedly right in making man's upright bearing the keystone of his entire organization. The lower extremities were lengthened, and their supports strengthened, while the upper extremities were dispensed from locomotion, and fitted up into an organ of all work. The hand, that organ of organs, as Aristotle calls it, with its thumb turned inwards, has a suppleness and daintiness of sense unrivalled by any organ in the animal kingdom. Apes have, it is true, four hands ; but as all four are locomotory they have none of that nimbleness and flexibility which are peculiar to the human hand. Anthropoid apes occasionally lay hold of stones and clubs in self-defence ; but this is the highest use to which they put their hands. There is also a considerable difference in the relative lengths. The arm of the ape is disproportionately longer than the human arm. Neither has any man a prehensile foot, although savages are sometimes credited with it. But the stoiy is just as fabulous as the fiction which represents men with tails. Vogt, Haeckel and Huxley gazed with loving fondness on the prehensile foot of the negro ; but when they hugged and embraced it, it melted away, for it was only such stuff as dreams are made of. Anthropology and ethnography[3] have no information of man's capacity to turn his toes inwards like an ape. Man can, it is true, in exceptional circumstances, write or paint with his feet ; still, the foot never becomes prehensile. The relations of the several parts (*e.g.*, toes) are very different in men and apes. The proportion of the shin-bone to the foot is as 82.5 to 52.9 in man, and as 80 to 72.8 in the chimpanzee.

Connected with man's upright bearing is his facial and cerebral formation. The position of the nose and jaw de-

3 See Schneider, *Naturvölker* 1, p. 7, seq.

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termines the form of the face. The more the jaw protrudes, the greater the animal tendency to sensible pleasure which, on the contrary, is in inverse ratio to the frontal and nasal projections. The high forehead, too, stamps the human face as something more than material. Since the days of Camper the relation between forehead and jaw has been regulated by the facial angle, the lines of which pass over the highest part of the forehead and the middle of the orifice of the ear and meet in the upper front teeth.[4] In normal skulls the facial angle varies from 75° to 85°.

In the Caucasian race 90° is not infrequent, while in races low down in the scale and in idiots the average falls as low as 70°. These lower numbers, however, are uncertain. In any case the lowest outside limit must be set down at 64°. The facial angle averages 35° in a full-grown chimpanzee and 30° in the orang-outang. When these apes are in their youth their facial angle comes much nearer to that of man. Then it reaches 60° and 64°, but youth cannot be taken as the standard, because the jaw is only fully developed as age advances.

But the forehead is also part of the cerebral hemisphere. The most important part of the organism, to wit the brain, is encased in the skull. The size of the skull and the organization of the brain give a more distinctive character to the human body than the facial angle. Aristotle again says: "In proportion to his size man has more brain than all living beings; and men have more than women." Aristotle's words still hold good. In size and richness of convolution man's brain is superior to that of all animals, apes included. The size of the brain may be determined by measuring either the upper surface or the inner space of the skull,—the latter being the easier and surer method. Then an estimate is made of the weight of the contents. To obtain a sure result many measurements have to be made. According to Morton,[5] the maximum size of the

4 See *Natur und Offenbarung*, 1815, p. 428, seq.

5 See Rauch, *Die Einheit des Menschengeschlechts*. Augsburg, 1873, p. 146. Pressensé, *Die Ursprünge des Menschen*. Halle, 1884, p. 227, seq. Nadaillac, p. 435, seq. Schaaffhausen, p. 154. Bastian, vol. I., p. 269. Vol. II., p. 39.

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skull varies between 112·5 (Finns) and 77 (Polynesians) cubic inches; whereas the minimum size oscillates between 91 (English) and 58 (Peruvian). The mean is 96 and 75·3, and the average ranges from 93·5 (Caucasians) and 80·3 (Americans). According to Vogt's calculation in centimetres the maximum size is 1572·95 (English), and the minimum 1228·27 (Australians). But the calculations, although too uncertain to be of much use in establishing race-differences among men, justify us in classifying man apart from the animal kingdom. Thus Canaks measure 1470 centimetres, Irishmen 1472, negresses of Dahomey 1249, English women 1222, Indians, 1376 with a minimum of 1137, Esquimaux 1539, Parisians 1588. Cuvier's brain weighed 1831 grammes. A skull found in the American War was estimated to weigh as much as 1842. This is very remarkable because, as a rule, the skull capacity of North and South Americans, both now and in former times, is very small. Dante's brain hardly exceeded the mean; Gambetta's weighed merely 1165 grammes. If we allow the limit of 63 cubic inches assigned by Morton, man's skull has still the very considerable balance in its favour of 34·5, as compared with the largest gorilla skull. Some of the great mammals have absolutely a far larger brain than man, but in proportion to the weight of his body man scores a decided advantage. Man's brain compared with his total weight is as 2 to 47; the dolphin's is as 1 to 66; and the elephant's 1 to 500. The importance of this fact should not be overrated, since in birds the proportion is even smaller than in man, being as 1 to 14 in the greenfinch; still it is not wholly devoid of significance as regards man and apes. A full-sized gorilla or orang-outang is nearly doubly as heavy as a bushranger or as many a European woman, but his brain is at least one-third lighter than the smallest human brain. Even the lowest human skulls, those of the Papuans, are far ahead of the skulls of the highest apes, even morphologically. History also bears witness to the distinctive character of the human skeleton in general, and of the human skull in particular. Modern

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peoples are branded with the characteristic peculiarities of their forefathers. Not a single skeleton that has been discovered differs from our own in formation. Nowhere are we on the trail of an abnormal formation or impeded development. Doubtless strange specimens existed then as now, and were as exceptional in olden times as they are now. The skull capacity is the same in all. There is an analogy even between the Neanderthal and Caithness skulls and certain modern types; but all such are only unhealthy specimens. And yet they are far in excess of the maximum capacity of the ape's skull. So far the connecting link is missing. Facts are so few that any conclusion may be grafted on them. Nadaillac, not without irony, observes: "If four or five thousand years hence the "bones of a hunchback were found in the ruins of Paris, "might we conclude that all Parisians of the 19th century "were humpbacked?" The skulls with flattened foreheads found in Lower Austria were referred to the microcephali of Hippocrates and certain Indian stocks, and were declared to belong to an extinct race of men. It is now proved that the disfigurement was artificial.

For this reason Vogt sheltered himself behind the microcephali, and represented the defective skull-formation of the Cretins, as an atavism, or reversion to apedom. The brain of the microcephali weighs, on the average, less than the brain of an ape. At the Anthropological Congress held at Stuttgart in 1872, Professor Luschka exhibited the brain of an eighteen year old microcephalous girl. Its weight was only 450 grammes, whereas the brain of the gorilla weighs 600 grammes. Vogt, who confessed that he had never examined a microcephalous brain, was quick to draw a conclusion that has been generally repudiated.[6] Not sickly skulls, it was stipulated, nor skulls stunted in their growth, but only normal skulls should be compared.

6 See *Ausland*, 1872, No. 42, and *Die Reden und Berichte der dritten Versammlung der deutschen anthropologischen Gesellschaft*. On the history of the skull, see Nadaillac, *Die ersten Menschen*, Stuttgart, 1884, p. 30, 337, 523 seq.—Peschel is decidedly opposed to evolution. *Völkerkunde*, 3rd Edition, 1876, p. 41.

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Not content with taking up with a merely negative attitude the defence produced positive evidence to show that even the worst parts of a diseased brain retain the characteristics of a human brain, though in a lower stage of development. A reversion to the ape-type is therefore here out of the question. Privy Councillor Ecker, a specialist in the study of the brain, went the length of declaring that the fetus of the human brain bears from the first a distinctly human imprint. The present state of science, he said, allows that microcephalous phenomena are always intensely human. Schaaffhausen pointed out that the notion which pictured a creature as in part purely human and in part purely bestial was a very monster of unnaturalness. The microcephali, he says, are human by the law of heredity, nor is there any evidence of reversion to an animal state. The microcephali have, therefore, won their case and established their claim to citizens of the human race, while Vogt has been convicted of a gross libel. Consequent upon this verdict, the theory of man's immediate descent from a monkey is being gradually shelved among musty records, although the theory of evolution itself has not yet been consigned to the waste paper basket. And yet the case of the microcephali is the strongest argument that has so far been advanced by those who advocate the similarity of the brain of man and the ape! The conviction has been gradually gaining ground that the human brain possesses something besides size and weight, viz., a specific organization.

A keen practised eye, it is true, will often fail, after the closest scrutiny, to detect any difference between its organization and that of other embryos. But among animals, curvatures do not always express capacities. In respect to the convolutions and windings of its brain the donkey may be at the head of the animal kingdom and still be a donkey, as Galen has remarked. Nevertheless, organization cannot be a cipher in the problem. We know too little about the animal's soul to form any certain judgment as to its life. But a serried phalanx of modern ani-

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mal psychologists are drawn up in battle array, ready to measure swords with Galen in behalf of the donkey's rights, and to avenge his insulted honour. In their eyes the donkey is a most estimable being. They have bound the laurel wreath of wisdom about his brow, and decreed him a place among the "philosophers" of the animal kingdom. If these men can go into such ecstatic raptures over a donkey's brain, it is surely permissible to indulge in a little sober enthusiasm over the brain of man, which differs more widely from that of the anthropoid ape than is commonly represented. Of course the cells and fibres are the same in both. A searching chemical analysis betrays no differences; but the higher functions are not under the bondage of chemical combinations. Man's perfect organization is conditional on the number, arrangement and inter-crossing of the nervous passages. Gall's skull theory is again in fashion, because the brain is proved to be the seat of the several faculties. Thus Broca thinks he has discovered a definite point, situate in the left cerebral hemisphere, on which the faculty of speech is poised. Anyhow man's brain is more developed than any other. Its many intricate windings serve to enlarge the surface and to increase its capacity. The highest grade of development does not lie in the number, but in the perfect finish and formation of the parts. The brain of the negro and of lower races is always human, although of course it is less perfect, if not also smaller on the whole than that of higher stocks.

May not this difference, however, be a symptom of gradual transformation?[7] In answering this question we shall not repeat the objections already urged against evolution, nor allude, except in passing, to the fact that no historical evidence is forthcoming of an ape's brain being transformed into that of a man. Here we propose to examine the special reasons that govern the development of the brain. Sensation is said to be the determining agent. It

7 Schaaffhausen, p. 358, 428. Zacharias, p. 91.

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is certainly the first inexplicable action in physiology. If this fact be assumed, it must hold good of man as well as of the brute. But surely the evolution of a brain power equal to Goethe's or Newton's cannot be merely a question of time! Perhaps it will be said that the thinking organ is not for purposes of thought, as the eye was said not to be ordained for purposes of sight. The question can hardly be decided on scientific grounds. Still in point of fact it is certain that those alone see who have developed eyes, and that those alone think who have a developed human brain. The theory that the thinking organ and thought are correlatives must be considered as certain and in harmony with facts, until thought is proved to have been gradually evolved from the thinking organ, or until better traces of thought are found on the confines of the animal kingdom. As man did not give life to himself, so neither has thought created its own organ. In his unending struggle with wild beasts and the elements, primitive man prevailed not because he was stronger or better armed, but because his instruments were more perfect; he had a brain to give the word of command, and a hand to execute it. Anaxagoras had said that man is the most prudent of animals because he has hands. Aristotle rebuked him: Rather, said he, man has hands because he is prudent. As a flute is given to a player, not the art of playing to a man with a flute, so the organs are given to man who is capable of thinking. Alone of all animals man stands and looks up to Heaven, because he alone shares the divine nature. Thought and labour are works of a divine being. They would not be easy if the weight of the body had been forcibly pushed upwards, for a heavy weight clogs thought and renders perception unwieldy.[8]

The drawbacks to the human organism tell as little in favour of selection as the advantages. To begin with, the most striking is the absence of a tail. For this deficiency no sufficient reason can be assigned, as man is quite singu-

8 *De part. an.* 4, c. 10. *De an.*, 3, 8. Petavius, *De opif.* 2, 4, 7.

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lar in this respect. The incipient tail in the fetus shows at most a disposition, without giving any clue to its deterioration. Want of use is insufficient to account for it. The coiling tail could be dispensed with, if the animal had gradually exchanged its climbing propensities for walking, but many monkeys still climb and use their tails. Evolutionists, to be consistent, must hold that the coiling tail was transformed into a walking organ. Many land animals, in spite of living on land, walk on all fours and yet have a tail which renders good service in other ways besides climbing. This change in their mode of life would have either destroyed or improved the tail, as may be seen from the ape's clumsy walk on level ground and the waddle of the gorilla, supporting himself on his bended hands. Take again the want of a hairy coat. It is admitted that selection could not have dictated its abandonment, since the man without hair has less chance of withstanding the climate, and enduring wind and weather. If it be universally true that the organism which is simple and developed all-round is better adapted for the struggle for life than the organism which is complex and has only a one-sided development, then the want of a fur coat cannot be explained on the principles of selection. On such principles it would indeed be most surprising if a hairy coating were not formed, since the disposition is already there (the embryo being covered with down) and individuals have a luxuriant growth of hair in various parts. Then, too, what a bulwark it is against the subtle encroachments of climate! Sexual selection does not lift us out of the bog. How, if hairiness were universal, could a stray male with less hair be an attraction to a female, or *vice versa?* But, letting that pass, we would further ask, how this fashion was enabled to gain the ascendant and to extirpate all hairy individuals in the teeth of the fact that hairiness is useful in the struggle for life? We are crediting our great animal-ancestors with advanced æsthetic tastes that are hardly to be found among modern savages. Nor can the beard, which occurs in animals also, be ex-

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plained in this way. For it would be too exacting to expect æsthetic females to renounce the beard as well as the hairy coating. Each race, as Darwin says, has a predilection for those characteristic peculiarities which have been gradual in their growth. And Wallace rightly thinks that a hairy race would have admired great hairiness as much as modern bearded races admire a fine bushy beard. Thus a liking for partial hairlessness would have been as rare and as abnormal as a preference for partial baldness, or for the few straggling hairs of which women can boast. No effect could follow from an individual having a taste for such an abnormal peculiarity. But it is in the highest degree improbable that such a fashion should have become a general favourite with our semi-human forefathers and resulted in total hairlessness. Such a phenomenon is without parallel in the history of the animal kingdom. The "porcupine" men, the descendants of an Englishman of Euston Hall, Suffolk, who was covered with warts half an inch long and as thick as string, died out in the third generation. Extinction is the lot of all monstrosities. To base a calculation on them is to build science on the extreme edge of hazard. The abnormal succumbs to the normal.

Man is not, on the whole, so well accoutred for the battle of life as the animal. He is more sensitive to wind and weather, and a prey to many maladies. His diet is limited. When he first comes into the world, he is more helpless than any other organic being. He needs the support of his parents longer. Is this the outcome of the struggle for existence? Surely this cannot be the goal of its ambition! Man can provide himself with food and raiment from animals and plants, says S. Thomas, since he presupposes both. Hence nature leaves him naked, because he can clothe himself. Nature supplies him with no food but milk, because he can procure other foods for himself. Supposing the difference between man and animal to be as represented above, this is the simple explanation of man's present condition. For man has, indeed, the

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power to set nature at defiance and bid her do her worst. He can procure for himself the best of food and clothing; he can till the ground and make fire his servant; he can make his armour proof against all nature's shafts, and can forge for himself weapons that enable him to hold the field against all comers. But the need in itself is not enough. Man must have had also the capacity to use them. It is arguing in a circle to say that the needs of living organisms are gratified for the same reason that they exist.[9] There is a recognized limit to the needs of animals. Many faculties which seem to supply a need, are really born of instinct and desire. The spider weaves its web from pleasure, not from hunger, and the bird sings from sexual excitement. Hence we are led to suppose the existence of a spiritual element in man.

The physical differences between man and animals should not, however, be exaggerated. Nor again should they be underrated in such a statement as the following: "In "form, in build, and throughout his organic tendencies "man is an ape."[10] For not only is the similarity not proven, but the spiritual activity for which the organism is destined involves physical differences. It cannot have been, in the first instance, the product of education. Education can work wonders, but it cannot change the nature and peculiarities of the human species. Physiology and morphology have not yet succeeded in laying hands on the parents that gave birth to the first human being. The scouts of science have explored the whole earth, but they can find only men and animals. Their search for a being half man and half animal has been fruitless; they were never even on the track. Even the Bushrangers are men, and not semi-apes. So far, as Wallace, Huxley and Virchow allow, the excavations of science have brought to light no fossil ape-skull or skull of a man-ape that can have

9 See Pflüger, quoted by Pesch, Vol. I., p. 393. Secchi, p. 25.

10 Broca agrees with Pressensé, p. 229—See on the other side Quatrefages, *The Human Species;* Nadaillac, p. 453—Pfaff, *Schoepfungsgeschichte*, 2nd edit. Frankfort, 1877, p. 722—Tylor, *Anthropology*.

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belonged to a human being. Even the oldest skulls that have been found are human. "Dolicocephalic or brachy-"cephalic, large or small, orthognathous or prognathous, "quaternary man is always man in the full acceptance of "the word. Whenever the remains have been sufficient "to enable us to form an opinion, we have found the hand "and the foot which characterized our species; the verte-"bral column has displayed the double curvature. . . . "The more we study the subject, the more are we con-"vinced that every bone of the skeleton, from the most "massive to the smallest, carries with it in its form and "proportions, a certificate of origin which it is impossible "to mistake."* The crude theory of Vogt, according to which man is descended from one of the extant kinds of anthropoid apes, must be set down as obsolete. For the human body has but few similarities with the highest representatives of this class, that is, with the Asiatic orang-outang, the gibbon, the African chimpanzee and the gorilla. If, as Huxley contends, man is more like a gorilla than a gorilla is like a lemur, and if there are greater differences between the several species of apes than between man and certain apes, his contention, while failing to prove the descent of man, throws a doubt on the descent of apes from a common ancestor. There are as great gaps in the genealogy of apes as in that of other classes of animals. Nor, again, is it legitimate to compare sickly, deformed men with strong and healthy apes. Given a proportionate distribution of air and light, the gap is so wide that direct descent is out of the question. Man's origin, then, must be traced further back to a tree, from whose trunk sprang two branches—man and the anthropoid ape. The hairy *Pithecanthropos primigenius* is accepted by Haeckel and Darwin as the common progenitor of man and gorilla. Both male and female wore beards. Their ears were probably pointed and movable. A tail hung from the body. Veins and nerves took a different course. Our first parents had,

* Quatrefages—*The Human Species*, p. 294.

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too, prehensile feet, climbed trees, and inhabited a warm well-wooded country.[11] At a still earlier period they must have been water-animals, for the lung is a modified swimming bladder. Monthly and weekly periods point to the strand washed by the waves as our first birth-place. The organization of our forefathers must have been as simple as that of the amphioxus with its notochord (*chorda dorsalis*). Hence the traces of our primitive forefathers lie not on the earth but under the earth. Africa is the spot selected by Darwin and Huxley; Haeckel prefers Southern Asia, but suggests the Indian Ocean as an alternative. In this question palæontology allows the greatest latitude, because it says absolutely nothing about primitive man. It may still be convenient to leave man's cradle in the sea, if we except a few remnants of islands like Madagascar and Ceylon. Link, Sklater and Haeckel christened this part of the world Lemuria from the lemuridæ which, they pretended, were found only in these parts. Meanwhile lemuridæ have been discovered in tropical America, and fossil remains of anthropoid apes both in Europe and America. So this hypothesis, alas! has tumbled overboard into the sea. Hence Darwinians are forced to admit that the animal forms, to which they ascribe the origin of the human race, have long since perished. Not even a bone has yet been found. Neither physiology nor history furnishes a proof for this alleged descent. As to the factors in the transformation nothing at all can be said. Here we need dwell on one only, which is the stile by which we pass over to the spiritual domain.

Articulate speech and man's erect attitude are said to be the chief proof that the human organism has undergone an essential change morphologically. These two physiological functions ought to have produced great morphological changes, and to have given a spurt to the development of the powers of the soul. From speechless or pithecoid man

11 *Abstammungslehre*, 3rd edit. 1875, vol. i., p. 67—Mohnike, *Natur und Offenbarung*, 1884, Nos. 8-10—Oscar Schmidt, *The Doctrine of Descent and Darwinism* (Internat. Scient. Series)—Schneider, i., 6, 27.

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to rational man a complete transition has been effected, owing, it is said, to the acquisition of language as the articulate expression of words and concepts.[12] But the *petitio principii* is so shining and so evident that it will glimmer through a blind man's eye. Surely the upright position and language must themselves be accounted for before they are made a stepping-stone to evolution. The upright position is universal among men, and universally absent in apes. If the perfection of brain and larynx is dependent on the evolution of speech, then a properly developed larynx and brain must be the companions of speech that already exists. But how did these arise? The "gradual acquisition of the upright position" is not proved, nor has it anything whatever to do with the organs of speech. However, even if this unwarranted assumption be let pass unchallenged, it has still to be explained how vocal organs, intended originally for the production of rude inarticulate sounds, have been made capable of speech. If this change was preceded by a partial formation or transformation of parts of the brain, the puzzle has veered round to its first position. Not the faintest ray of light breaks through the mysterious darkness. Man is man only by speech; to have speech he must be already man.* How comes it that only this branch of the original tree has "luckily" been able to adapt itself to this development? One would suppose now that it would be much easier for the other branch to grow to the same height, since in man who walks erect and speaks it has before its eyes a fine model and an excellent instruction. But all the efforts of selection and education have been unavailing to train man's first cousin to walk upright or to talk. He is and remains a climber, in nowise a *homo alalus* but a *simia alala*.

In speech lies the broadest and most powerful distinction between man and the brute. No brute has speech; no properly developed man is without it. Man speaks, but no animal has ever uttered a word. Speech is our Rubi-

12 Schaaffhausen, p. 175 seq.
* Alex. von Humboldt.

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con, and no animal will dare to cross it.[13] Speech is the great distinguishing feature of man.* The sounds of animals are inarticulate, although highly serviceable for expressing a feeling or an instinct, and they are always the same in the same species. The mechanical prattle of parrots can no more replace human speech, than a machine or automaton will enable us to dispense with the human body. It is certain too that the speechlessness of animals is not to be referred to their organic structure, to their anatomy, or their physiology. Its cause is rather psychological and intellectual. Animals are speechless because they are thoughtless. For our present purpose it is of little moment whether language is marching upwards towards unity, progress and perfectibility, or is on the downward path to dissolution and decay ; for both tendencies move within a human sphere, and neither gives a hint as to the origin of speech. Where man is, there is speech. History tells us that speech has attained various degrees of development which have existed and still exist side by side ; it shows how language, with its combinations and distinctions has been formed ; it exhibits its grammatical and syntactical rules. But in regard to the origin of language the voice of history is as silent as a stone.

Language, it is true, is connected with the development of the brain. The Cretins do not acquire speech. An injury to the brain may entail loss of speech. Is language therefore a function of the brain ? If it were, it would prove nothing over and above what we have said about the human brain ; the function would stand on a much higher level than the organ. But in admitting that speech depends on the brain, we pass no judgment on the causal relation between the two. How can there be such a relation between a material brain and speech, which is spiritual in its nature ? Speech is but the expression of thought, the word within the mind. There is no speech without reason.

13 Max Müller, *Vorlesungen über die Wissenschaft der Sprache*, 1863, vol. 1, p. 303 ; Schneider, I., 50.

* Huxley, Cuvier.

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Reason and speech are correlatives. In man there is a hidden force which when conceived as an internal activity is called reason, and when conceived as something external goes by the name of speech. We cannot penetrate into the mind's secret workshop where abstract thought is gliding noiselessly and stealthily through piles of intuitions. But of conscious thought it is ever true to say : all thought is speech, all speech is thought.[14] There is no reason without speech, nor the converse. Man originally means a thinker. The first process of thought is the word. Logos the thought, and Logos the word are indissolubly wedded. Our words are not mere sounds out of which language has grown. As touching the origin of language, even Darwin attaches no importance to the conclusion drawn from the various sounds emitted under different psychic states. Noiré has expressly retracted the theory he had built upon the lucubrations of Schopenhauer and Geiger. The idea would never strike a sagacious animal to utter, say a cry of alarm as such, nor could it convey any meaning to other animals. The interjection and imitation (Pah-pah and Bow-wow) theories also break down. No language is formed in this way, as the roots of language amply demonstrate. Otherwise it would be quite inconceivable how animals, that give vent to natural sounds and interjections, never became possesssed of speech.[15] Popularity has been courted of late by the theory of sympathy which explains sounds as a sort of reaction against the internal disturbance caused by muscular exertion. This theory carries plausibility in its train, because many words may be derived from roots signifying primitive acts ; but after all it rather describes a fact than explains the origin of language. Physiological impulse is the sole agent. Words are signs, freely chosen, by which the thought-object derived from

14 Tertullian, *Adver. Prax.* C, 5—Kuhn, *Trinitätslehre*, p. 191. Max Müller, l.c. vol. II., p. 62. *Essays*, II., viii. p. 400 seq. *Ausland*, 1873, No. 3. Knauer, *Psychol.*, p. 176 seq. Kleutgen, *Theol.* II., p. 51, *Philos.* I., p. 74—Secchi, p. 42.

15 Max Müller, *Essays*, vol. II., p. 442, 447 seq. *Wiss. der Sprache*, vol. I., p. 307—Lotze, II., p. 233.

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external perception is formed into a concept and outwardly expressed.

No inward connection exists between ideas and the symbols of language except in so far as the name expresses some quality of the thing; *e.g.*, horse = speed. But plainly the inward connection lies not in the symbols but in the ideas, in the concepts which are finger-posts ever pointing towards reason. The word always issues from the reason (*procedens ab intellectu*), exists in it (*in intellectu existens*), and is the image and likeness of the thing conceived (*ratio et similitudo rei intellectæ*).[16] With the aid of abstraction and generalization reason joins subject and predicate, and invokes the principle of causation in the verb. Every sentence contains a judgment, and all the judgments combined are the natural logic of reason. No one ever becomes possessed of speech who cannot think, count or calculate. What vast mental labour is enshrined in a system of numeration, which implies the abstract idea of quantity and the power of classification! But the animal's lessons in arithmetic never get as far as the number one! It utters natural sounds not words; it has something in the sense, but nothing in the intellect. The word proper, full of spiritual contents, is the *verbum cordis*, and the *verbum oris*, or word of mouth, is its expression. Reason is not an offshoot from speech, but speech is the offshoot of reason. Speech comes from within, not from without; it is a natural gift characteristic of the race, ingrained in the constitution of man.

But does not every child learn to speak before it can use its reason? Is not then the order followed by the child of necessity the natural order? As there is no example of a man teaching himself religion, so no one has been known to teach himself a language. There is no need to enquire into the genuineness of alleged instances of want of speech in people who have been cut off from all educational and

16 See S Thomas, *Summ. Theol.* 2, q. 110, a. 1—Knauer, p. 180. Richard Simon, *With St. Gregory of Nyssa. Histoire Critique du Vieux Test.* p. 484, 83 seq. Pesch, vol. ii., p. 183.

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social influences since their childhood.[17] The fact that every child has to be coaxed into speaking goes far to confirm their truth. The "mama" and "papa" cries are assuredly no instance to the contrary. The child repeats the words it has heard without understanding their meaning. At first its utterances are indistinct and incorrect; then it gradually pronounces the words more clearly; but the sense of the words dawns on the child comparatively late. When children speak, they neither discover language, nor master its meaning, but learn both language and meaning from others. There is no historical record of any language being discovered in this way. Which language would the child hit upon? It is infallibly certain that no German child, if left to itself, would ever begin to babble in German. According to the scholastic philosophy the child's budding powers are unfolded by the balmy breezes and sunshine of the external world. Since human society exists in every corner of the earth, we cannot of course prove from experience that men would never think at all without instruction, nor again that the internal word must be acquired through the external. Neither does experience lend any countenance to the contrary assertion, on which the burden of proof first lies. The same rule must in consistency be applied to all peoples. Still it does not follow that all knowledge rests on tradition, or that speech is merely a set lesson to be learnt. The string sounds only when struck, and it is the string alone that sounds, but every string has its own peculiar tone. No wood, says a common proverb, no pipe. Theologians who refer language to God are not in good odour. Perhaps theologians deserve as much blame as their adversaries for not distinguishing the form of the Bible narrative from its psychological meaning. God did not infuse language into man, but with reason He bestowed the faculty of

17 Rauber, *Homo sapiens ferus*, oder Die Zustände des verwilderten Menschen, Leipzig, 1885. See *Grenzboten*, 1885, No. 43. *Natur und Offenb.*, 1885, p. 424 seq. Kuhn, *Trinität*. p. 632. Pascal, *Pensées*, 25, 17. Max Müller, *Wiss. der Sprache*, vol. I., p. 293. Tylor, p. 152, 178—On the Schoolmen, see Kleutgen, *Philos.*, vol. I., p. 180, 387 seq.

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speech. God was not as a schoolmaster giving man lessons in spelling, but he gave man an opportunity of bringing his faculty of speech into action. It is related that the Lord God brought the beasts of the earth and the fowls of the air to Adam to see what he would call them. What else does the narrative mean but that Adam was bidden by God to exercise his faculty of speech? "For whatsoever Adam called any living creature, the same is its name."* Do philosophers make the mystery as clear as founts in July by evolving language from speechlessness? Man must needs learn speech; but how shall he learn it without the disposition thereto, namely reason?

Reason, then, is the chief distinguishing mark between man and brute. Reason and intelligence have set their seal on the human soul—that soul which exalts us above the brute, and invests us with the majesty of man.[18] Has the brute, then, no psychic and spiritual faculties? When S. Thomas says that man's superiority over the brute is due to his reason and understanding, he seems to attribute something of the kind to animals. Animal consciousness and the appreciative faculty (the *vis æstimativa* of the Schoolmen) cannot well be denied of animals. According to Aristotle, animals, besides having the sensitive and appetitive faculties in common with us, have also something analogous to reason—a shadow limping behind the substance. In what does it consist? It includes, firstly, simple consciousness, or a kind of feeling that the action is right and proper, and secondly, the almost instinctive deliberation that as a rule immediately precedes the action. This latter it is which raises instinct above blind natural force; it alone can account for the limited variability of animal actions. How is this *vis æstimativa* combined with instinct? Herein lies the difficulty. In itself it must not be identified with the understanding. But the appreciative faculty, if stripped both of reason and of all particular

* Gen. II., 19.

18 S. Augustine, *In Joannem*, No. 49, 9 (ad. 10, 18). See *Epist. ad Diognetum*, 8, 2. *Controverse*, 1882, No. 50, 51. S. Thomas, l. c., I. q. 3, 1 ad 2.

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judgments, will be but a hollow empty box. Reason is not necessarily implied in a simple judgment, which often bears merely on the action and passion of the sentient agent. The Theory of Descent not only derives our intellectual properties from animals, but with similarity of action as the mainstay of its argument, it represents the intellectual difference as merely one of degree. Quatrefages thinks that intelligence unmistakably exists in animals, and that therefore most stress should be laid not on intelligence but on religious and moral character.[19] Flügel and others draw a distinction between reason and understanding. Many others, on the contrary, think this is standing on too fine a point. We have no wish to exaggerate the intelligence of animals, nor, on the other hand, can we shut our eyes to the facts of experience. There is no need either to make the animal more animal than he is, or to make him a man. The abyss between animal consciousness and human self-consciousness is quite broad enough. No further landslip is needed to widen the breach.

The stories told of animal knowledge are merely the outward expression of an instinctive cognition, which differs in different classes but always remains the same in the same class. It revolves in a narrow circle, and occasions reaction in the same and similar cases only when influenced from without. Or it is limited to a sort of deliberation whose target seldom lies outside the short range of sensible pleasure. Sometimes animals seem to take certain aim at nobler game; when, for instance, they surmount or circumvent unforeseen obstacles, or show that they know how to encounter danger methodically. But in these cases, either a sufficient reason is wanting for the action, or the motive is merely apparent. All appearances to the contrary notwithstanding, that unconscious and unknown impulse which we call instinct is the centre in which the radii of animal psychology meet. Who will explain without instinct the bird's handicraft in building its nest? the

19 *Controverse*, 1880, p. 108 seq.; 1882, p. 604 seq. *Literar. Rundschau*, 1882, No. 2. Flügel, *Das Seelenleben der Thiere*. Langensalza, 1886, 2nd edit.

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skill displayed by ants and bees in the construction and government of their hive and home? the cleverness with which insects provide for their young; the ingenuity of the bird of passage during the long voyage? the craftiness with which beasts unfailingly secure their prey? the instinctive recognition of hostile animals? the sense of space and direction possessed by birds, bats and insects? The non-progressive character of these habits stamps them as instinctive. The nests of the swallow and weaver, the architecture of the beaver, and the cells of bees are the same to-day as they were four thousand years ago. Occasional exceptions and modifications are to be met with, but they were brought about by the special difficulties the animals had to encounter in the locality or other causes, against which their instinct fought and prevailed. As the bird lays again when its eggs are robbed, so it repairs its nest when damaged, or rebuilds it when destroyed; but a diminution of physical power is consequent on both actions. It seems to be really a fact that birds, contrary to their usual practice, sometimes choose high ground for their nests, when an inundation would have destroyed the nests in the following summer had they been built on the flat level. This is clearly not a deliberate act, for the reason of an intelligent being would be unequal to such a feat. However we explain it, whether we fall back on a faculty of presentiment, or suppose a mysterious connection between the animal world and nature, the fact is of no use to establish the claims of animals to higher intelligence. For the animal's intelligence would have to be placed above man's reason,[20] since it works for a purpose without deliberation. Besides, how few are the animals saved from destruction by such foresight!

The same reflection applies to the animal's care for its young. The black beetle lays its egg on a dead mouse, and buries the mouse; the butterfly lays its egg on a cer-

20 Altum, *Der Vogel und sein Leben*, 4th edit., 1870—Von Binzer, *Instinct, Verstand und Geist bei Menschen und Thieren*. Heilbronn, 1884—See also *Natur und Offenb.* 1885, p. 294 seq.

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tain leaf, and the ichneumon fly in a living grub which keeps the creeping larva supplied with fresh food. How can such modes of procedure be the outcome of reflection? The insect is mindful, it is said, of its own early larva state. If lower animals remember their early days so well, and use their memory to such good purpose, then to the face of every human being there should rise a blush of shame crimson enough to thaw the consecrated snow. The "unconscious memory" of matter or of the animal is an imaginary quantity. The puny beetle artist, when building a home for its eggs and larvæ, sets to work with an air of professional assurance that would astonish a skilled workman.[21] Beetle buildings, it has been recently shown, are constructed according to mathematical laws. Oddly enough the beetle's skill seems to decrease, not to increase with practice. In like manner the bird that pairs a second time seems to forget the prettiest melodies of its first nuptial song. Neither memory nor practice, whether of the individual or of the race, can unfold the philosophy of things so strange and withal so common. Again we stand in the presence of an unknown power—instinct.

As the senses and the human brain co-operate with mental activity, so the animal's senses and nervous system enter into partnership with its instinct. Yet there is no explaining how they work together without assuming a certain disposition in the faculty of perception, and a regular natural inclination in the appetitive faculty. As the motory and sensory organs have a fixed aim, so it is the business of the psychic faculties to employ them as means to an end. This psycho-physiological adaptation of the organism, the feeling of pleasure and pain, the impulses re-acting on inward states and outward impressions, —all postulate a basis other than material. The certainty and clockwork regularity of its action give to the animal the appearance of a machine; but it is only such when

21 Wasmann, *Der Trichterwickler. Nat. und Offenb.* 1883. Pesch, 1, p. 571 and 415 seq. Bonniot, *La raison chez les insectes. Revue du monde catholique*, 1882, p. 111 seq.

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contrasted with the free-will of man. The mechanism of a machine differs from that of a natural event, because the motive cause lies in the machine itself, and is not inseparably bound up with irrevocable laws, however limited its line of action may be in other respects. Though the feats of memory and deliberation performed by domestic animals be greatly exaggerated, they still attest the presence of a *vis æstimativa*, a certain power of calculating chances. The cunning and sagacity of the elephant, fox and wolf are proverbial. The ingenuity of ants in using wood-lice as milch cows does credit to their economic arrangements. Even if these actions, as being essentially connected with the senses, are put down to the memory and imagination of the sensitive soul, there is still a certain surplus of progress or development. If we allow our fancy to wander free as air we may come to regard the external acts of the dog and ass, for example, as signs of imaginative activity. In addition to the change in bodily habits, the instinct also is changed and perfected. The different breeds of dogs may be traced to a common stock. Yet how varied are their instincts! The sporting dogs, trained to scent and follow game and birds are, from their birth, fitted for their task not only by outward organization but also by an inward disposition. As in the case of variability so here also the gradual change in specific psychic conditions is circumscribed within certain narrow and well-defined limits. The wondrous achievements of domestic animals are the result of training: there is not even a mangled shadow of mind in them. In a free state of nature such changes are rare and small in compass. On the whole the animal is stationary. Many levers have been applied to lift him up, but he is still down. Now as heretofore he is governed by an instinct essentially the same. Sense-perception is the sole guide and support of his intelligence. He conceives and remembers, judges, ponders and foresees at the beck and call of an inward impulse, which lacks distinct consciousness. Instinct is at once the highest and the lowest psychological function: highest in virtue of its

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"demoniacal infallibility," lowest by reason of its blind fatalism.

With man it is not so. Instinct certainly lies at the bottom of his being. Not only are there many involuntary semi-conscious acts in the play of everyday life, but a divine unerring instinct is often a safe guide on the giddy heights of spirituality. Many a creation of genius has been due to an unconscious inspiration shooting across the soul at the right moment. Still such results are possible only when there is a spiritual basement to build upon. In man the *vis æstimativa* is governed by reason, not by fixed laws. Free deliberation follows on the involuntary suggestion. Unless the normal activity of the spirit goes in advance, genius is impossible, and the thought cannot be carried out. Man is made to think. Herein lies his dignity and his superiority to the brute. I can conceive a man without hands and feet; I could conceive him even without a head, did not experience tell me that he thinks with his head. Thought, says Pascal,[22] is the crown of man's being. We cannot imagine man without it. This is the key to the feeling of abhorrence with which men regard the idea of being descended from an animal and an ape. Men may think to daunt us by dinning into our ears that it is nobler to be descended from a highly organized animal than to be formed from a lump of clay. But they cram these words into our ears against the stomach of our sense. For we shall not lightly forego a divine for a bestial origin. The Fathers of the Church dwell on the shamelessness of the Platonists in placing the souls of men and brutes on terms of equality. The devil, thinks S. Chrysostom, sought to convince himself through these men that our race stands no higher than irrational creatures. Some, he says, must have eaten of the insane root that takes the reason prisoner to have the face to maintain that the irrational and the rational are all one. S. Augustine says it is rebellion against the Catholic faith to hold that the irra-

22 *Pensées*, xxiii., 23, 1.

tional animal soul is transformed into the rational soul of man. Even the disciples were ashamed of their master's philosophic frivolity, and excused him by saying he had been misunderstood.[23] By his specific action of thinking man is lord of nature, and capable of great progress in art and science. By his skill and power of invention combined he has made the soil and the beasts of the field his servants. He understands more and more how to subdue the forces of nature and bend them to his will. Machinery, steam, magnetism and electricity have been pressed into his service. Who can count all the inventions that have been called into being to minister to man's wants and pleasures, to provide him with food and clothing, and to further the general good of the race? The animal has had no hand in promoting this general advancement. His part is purely passive. Man alone is progressive. The beginning of all civilization is the use of fire. Its use is known even to the tribes of New Guinea, but to no animal howsoever advanced.[24] What an immeasurable interval separates the primitive uses of fire from its employment in machinery, where the heat of the sun that has been pent up for centuries in the coal is transformed into kinetic energy, and sets the engine in motion! The telegraph has almost annihilated space and time. The spectrum analysis has revealed the secret of stars, many thousand times further off than the sun. No struggle for existence, no manner of natural selection, no gradual inheritance of collected experiences, as Mr. Herbert Spencer will have it, can break down the barrier that separates man from the brute.

And yet we are still lingering in the atrium of the human mind. There are still higher steps to mount. Self-consciousness and the power of abstraction may be considered the two topmost turrets of man's intellectual activity.

23 *De Gen.* vi., 9, 13. Chrysost. *Homil.*, 4, 4, in Act. App. Homil., 663, in *Joan.* Basilius, *Hexameron*, viii., 2. See Weiss, *Die Kappadokier als Exegeten*, p. 59, seq.

24 Gloatz, II., p. 916. See Schneider, I., 58.

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Man alone can distinguish himself from all things else, can alone form a clear and distinct idea of his own personality, and thus, as it were, split himself up into subject and object. Thus he knows that he is the subject and cause of his own activity. He also knows himself to be one in being, and individually independent. At the same time he can in a measure fathom the being and existence of other things. For abstraction enables him to separate the nature and essence of things from their natural environment, and to distinguish cause from effect. What fathom-line shall touch the ground of this capacity? Not Positivism, which compresses all enquiry into causality; not English Associationism, which uncoils causality from the association of ideas; not Criticism, in fine, which hangs comprehension on moral intuition. Man could not rise from sense to the things above sense, before he had mounted the ladder of self-consciousness and soared as high as the idea of a spiritual unity. That man's spiritual nature transcends the world of sense seemed to S. Augustine to be best proved by the fact that there are in his mind thoughts, which mere sense and knowledge could never have generated. Such thoughts, he argued, are possible only in a simple being who clearly conceives himself to be the cause and subject of his own activity. No causal connection can be established between the movement of atoms in the brain, and that consciousness which manifests itself in pleasure and pain, and begets conviction of 'Self.' The physical acts are but the occasion for the higher psychic activity. The external half of human nature becomes itself an object of consciousness. Consciousness cannot possibly be merely the sum of myriads of atoms. For its manifestations show it to be absolutely one. Amid all the material changes of the brain, it clings to its unity and identity. The changes in the brain are, indeed, a condition of the soul's activity, but not the activity itself. The highest act of self-consciousness, namely, the immediate recognition of our own existence as expressed in the formula: *Cogito, ergo sum*, proves also that there is

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in the mind such a thing as *necessary* thought, which is independent of all external surroundings.

Man is, therefore, endowed with the power of abstracting the general from the particular; he can rise from things of sense to things above sense; he can form ideas and concepts of the very nature and essence of things. Thereby he puts a girdle round the whole universe of existing things. Thus he is enabled to create a genuine *science* of the nature and essence of things. Science is proper to man. Who ever heard of a science among animals? Thus man has unexpectedly created a new spiritual world, which has always been the ideal paradise of the pure and noble-minded. All other progress and knowledge glides only on the outer rim of human nature. Admirable though it be in itself, when compared with the noble conquest of the spirit it is as glittering tinsel to the pure gold. The boon conferred on the whole civilized world by the study of language in Southern Asia; the wise maxims enshrined in the sacred books of ancient religions; the profit accruing from the speculations of Greek philosophers on matter and spirit,—all these accumulated piles of wealth form such a rich storehouse of spiritual treasures that all things else seem as dirt. Of the treasures locked up in the Bible we make no mention, as they belong to the supernatural order of revelation. Here we must repeat the truth we inculcated above when treating of man's natural religious disposition. Man alone tramples under foot things earthly and temporal; he alone soars to the height of speculating on the eternal and the infinite. The apparent endlessness of space and time may stimulate thought; the contemplation of the boundless firmament and of the unchanged and harmonious movements of the heavens may suggest the thought of the immeasurable and the eternal. But the fact that man alone rises to such speculation, that he alone rises above his surroundings, proves that the spirit of man is exalted above all that is visible in the realm of the material universe.

Nor is man's *moral* life of less importance. Free-will is

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the noblest gift that the Creator has bestowed on man for his journey through life. Without the will the life of the intellect can be but half understood ; for there is much in the intellect over which the will holds sovereign sway.[25] In the moral and religious life the will is supreme. On the will man's worth and salvation depend. In truth the world considers the reproach of wickedness preferable to that of folly. God, says the Apostle, has chosen what is foolish in the eyes of the world that he may confound the wise. If man's dignity arises from his power of thought and intellect, clearly only right thought can safeguard it. Now right thought is the principle of morality.[26] Here it is not our purpose to discuss free-will, or to enquire into the merits of Determinism and Indeterminism. It is sufficient to show that man's moral life and advancement in good entitle him to be considered essentially distinct from the brute. Animals have no moral life. They are governed by their instincts which have for their end naught but nourishment and propagation. Only external force can prevent them from gratifying their instincts. Nature is not to be thwarted. The stories of love and hatred, sympathy and antipathy in the animal world may be reduced to one common denominator—impulse.[27] The love of their kind and the love of parents and of children are begotten of the impulse to propagate, and are largely the creatures of circumstance. Many a bird fondles the young cuckoo it has unwittingly hatched as much as its own offspring. A hen is not more solicitous for her own chickens than for the young ducks that come out of the eggs on which she has been sitting. The few exceptions among domestic animals are far removed from moral actions. The pride or shame manifested by the sporting dog, according as it has booty or not to lay at its master's feet, is certainly due to training : they are, in fact, a reaction on the reception ac-

25 Pascal, xxv., 10, Kahl, *Die Lehre vom Primat des Willens bei Augustinus—Duns Scotus und Cartesius*, Strassburg, 1886.

26 Pascal, xxiii., 5, 6.

27 See Hertling, p. 97. Gloatz, p. 95. Cathrein, *Die Sittenlehre des Darwinismus*, p. 34, Freiburg, 1885.

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corded him by the hunter. We might, perhaps, with the Scholastics, regard it as a faint echo (*obscuram resonantiam*) of morality,[28] but nothing more. Wedlock and family life, care for the dead and dying, the ethic and æsthetic sense, good behaviour—all, indeed, that usually marks the beginning of civilization—will be sought in vain in the animal. Animals neither laugh nor cry. They evince neither moral shame nor repentance except as accompaniments of the whip. Even anthropophagy, that blank moral aberration and rude excrescence of superstition, is a standing argument against a conscious free morality in animals. Only in the direst need will they eat their own flesh and blood. Such an act they regard with singular abhorrence. Suicide, again, is unknown in animals. The impulse of self-preservation is the only law. Occasionally instances of self-sacrifice are recorded of dogs, but they come of long and deep attachment to man and his belongings. Again, animals in a free state, owing to their defective liberty, are usually more limited in their diet than man, and consequently more exposed to hunger.

Moreover the character of human actions reveals a still more pronounced difference between man and the animal. Man acts with deliberation and with the full consciousness that he is responsible for his actions. Man alone knows the reasoning of the words: "thou shalt," and "thou shalt not," which impose on the conscience the duty of doing or abstaining from some action. Conscience hath a thousand tongues; its voice, sounding within the chambers of the heart, ceases not to cry aloud until its behests be done. If a man turns a deaf ear or disobeys its orders, the worm of conscience will ever gnaw his soul. Heroic acts of penance, and numerous acts of despair often ending in suicide, alike bear witness to the terrible, overwhelming power of this incorruptible monitor. Man alone can fight against nature, and repudiate from a higher motive, the claims of self-preservation. He alone can sacrifice, for vir-

28 Pesch, vol. i., p. 771. See Origen, c., *Cels* 4, 81. Max Müller, *Wissenschaft der Sprache*, vol. i., p. 302.

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tue's and honour's sake, the highest earthly good—life. To the heart, whose aspirations are heavenward bound, life is not the highest good. Heroism and martyrdom are as wonderful and elevating in the moral life, as the noble creations of genius are in art and science. Both alike are foreign to the animal world; neither can be worked by machinery. Eternal causes and circumstances undoubtedly exercise a powerful influence on the moral condition of nations and individuals; but they alone cannot weave a moral action. A man's life and character are frequently determined by his poverty or riches, by his education, by the good or bad example given him. War, famine and pestilence have an unhappy effect on the moral life of mankind. Nevertheless, although a strong plea for extenuating circumstances be allowed, there is no denying that individuals have the power to resist these baneful influences and to overcome temptation, since many have already resisted and triumphed. The records of all ages chronicle noble instances of virtue in evry condition of life, even among the most degraded peoples. How many, whose names are obscure or unknown, have kept their virtue in spite of temptation and persecution! Criminal statisticians may correctly maintain that it is possible to strike the average of crime, but this contention only bears out the word of Holy Scripture, that no man is without sin, and that the senses of man are prone to evil from his youth. Otherwise our penal code would be an injustice, which the struggle of society for existence would alone justify. Our prisons, too, would be replaced by lunatic asylums. Civilization and culture would be at an end. Of course Darwinians assent to this conclusion, although contrary to their principle. There is no real internal progress, they say: progress is only external. Man does not improve in the sense of perfecting himself. For a thousand years there has been merely development, not progress, in humanism, reason and morality.[29] Nevertheless, even those who hold

29 Hellwald, Caspari, Moleschott, and others. See *Ausland*, 1872, No. 49; 1878, No. 46. On the other side see Hertling, p. 102, seq. Cathrein, p. 76, seq.

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these naturalistic views make certain moral demands (varying with the times) on man and not on animals. They likewise give certain rights to man, but not to animals. The animal is slaughtered for man's benefit, but anthropophagy is universally branded as cannibalism. We have no need to defend existing moral and social relations through thick and thin. Frequent relapses may be unreservedly admitted. But the fault lies in the abuse of free-will, not in fate or a mere law of nature. The possibility of moral progress and restoration is abundantly proved by a comparison of early Christianity with heathenism. Neither can progress be denied in the history of the Church itself, if only the herculean labour spent in shaping the barbarian converts of Christianity be dispassionately considered. The achievements of our ancestors are not lost on us. Only the animal has always to make a fresh start.

So far we have been comparing *civilized* man and *civilized* society with brutes and brute associations. And most rightly so; for, as Aristotle has said, the true nature of a being lies in its perfection. Our line of argument would indeed be open to objection if we had pitted the lowest animals against the most highly civilized man. Such, however, has not been our mode of procedure. The highest brute, both intellectually and morally, is infinitely below civilized man; and we may at once add, the normal man, even of the lowest race, is far above the most highly organized animal. Historically it is not probable that man, intellectually and morally, is a psychical evolution from the brute. Ethnography has blown to atoms Rousseau's ideal child of nature. But the Darwinian substitute, namely speechless primitive man, the brutal savage, has also been mercilessly battered and mangled. Little as the savage is an ideal of innocence, from his birth he is and remains a man.[30] Every man has something of the animal in his nature; the savage has a greater quantity and a grosser kind, but he is still a human animal. Char-

30 See Schneider, I., 3. seq. *La civilisation préhistorique*. *Controverse*, 1881, p. 129, seq.; 1882, p. 620, seq. Nadaillac, *Die Ersten Menschen*, p. 25 and 50.

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acteristic peculiarities crop up at every turn. Australians and Tasmanians, Botocudos and Pescheros in South America, Bushmen in South Africa, are all men, whichever is to have the device "Lowest Race" emblazoned on its banner. So little was known of the earth in the days of Lucretius that there is some excuse for his hazarding the hypothesis that aboriginal man was a semi-animal, using neither fire nor clothing. Now, however, the earnest student cannot plead the backward state of knowledge. Darwin's blunder in relation to the people of Tierra del Fuego, which first brought home to him the idea of man's animal origin, was corrected long ago. No people is destitute of certain abilities and capacities, which are the sign of a free intelligence. To this even prehistoric science bears witness. The carved bones of wild animals found in the South of France and in the cave of Thainger reveal a fairly developed æsthetic sense, and a delicacy of artistic skill for which we seek in vain among modern savages (Schaffhausen). The same thing may be observed in America. The old mound-builders were more civilized than modern Indians, who were more civilized at the time of the Spanish Conquest than they are now. The Indians are a degenerate race. The arms and implements used by men in the Stone Age were doubtless rude and primitive; but to this day no animal has attempted to manufacture or use such weapons, rude as they were. The ideas that form the basis of social and moral life are familiar to all peoples. A certain social organization and tribal divisions obtained even among the most primitive races. The drawings above alluded to (which are modelled from nature) are suggestive and significant. So far only one small detached figure, representing a sort of *Venus impudica*, has been discovered. In Museums generally closed to the public may be seen crowds of such objects that have come down to us from the Greeks and Romans, whose advanced civilization is beyond question. Savages have the ideas of *meum* and *tuum*, and of good and evil, although they both steal and work evil. A little while ago an effort was made to forge

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an intermediate link between man and animals out of the Mincopians of the Andaman Islands, who were represented as cannibals and wholly devoid of moral and religious ideas. It has, however, since transpired that they have a horror of human flesh, believe in a life to come, devoutly worship their ancestors, and are superior to many civilized nations in morality.[31] The same may be said of the inhabitants of the Nicobar, who were visited by the Novara Expedition. Many wild and uncivilized peoples are no doubt sitting in darkness, but the darkness should not be artfully intensified. Their ignorance and moral depravity are pitiful and harrow up the soul, but the traces and germs of civilization must not be passed over and ignored. The responsibility of savagery, then, need not rest with man's animal origin ; for savagery must be regarded in great measure as a degradation and a decadence. This will be apparent when it is shown that the different races of mankind have a common origin. History states that many nations, Egyptians, Syrians, Persians, and other Asiatic tribes have actually relapsed into barbarism from a high state of civilization. The ruins of Egypt, Mexico and South America, and the monuments recently discovered at Yukatan, are a clear proof that the career of some nations has taken a downward course. In the seventh century the barbarians of Central Asia were highly civilized. The Redskins have retained a fairly pure notion of religion, but among other races in the same part of the globe civilization has given way to idolatry and human sacrifice. Faith and science both declare that man's condition in the beginning was purer and nobler than at present. Thus races degenerate, although progress is the general law. A backward and a forward movement may be seen going on side by side. The organic connection is often wanting, but it is of no moment in universal history. But the mere power of man is inadequate to explain this progressive tendency even in the remotest periods. Thus the difference between palæolithic and neolithic is considerable.

31 Quatrefages, *Journal des Savants*, Juin et Août, 1882. *Controverse*, 1882, p. 704. Schneider, vol. ii., p. 75, seq.

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Domestic animals have taken the place of cave animals; the nomad has become a settler, and the huntsman has turned husbandman. Shapeless arms and implements have been cast aside for polished axes that would do credit to a modern artificer. Dolmens (stone erections) and Menhirs (monoliths) were erected as temples or sepulchral monuments; nets were plaited, garments woven, and houses more securely built. What is the cause of this vast difference? Such advanced culture was not within the unaided reach of the cave men, and of those whose remains have been found in the Quaternary strata. In many places immigrations were frequent. Whence came the new settlers? Whence their civilization? Palæontology can give no answer to these questions. The Science of Language comes nearer the mark, but it also halts before arriving at the beginning.

Holy Scripture itself records progress alongside of sinful depravity. In its pages we find chronicles of the Stone, Bronze and Iron Ages, as far as they are really distinguishable. Civilization began, it tells us, when our first parents clothed themselves with the skins of animals after being driven from Paradise. The Stone Age lasted from Cain to Tubalcain, and the civilization of bronze and iron began with Tubalcain, the first smith. Revelation itself is an instance of progressive instruction, the preparation for redemption being gradually completed in several thousands of years.[32] This would be an appropriate place to treat of man's religious development, but as the subject has already been treated at length, this passing note will suffice.

And now we may safely leave the reader to draw his own conclusions in regard to the essential difference between man and brute. For our part we prefer to draw out a concluding argument in favour of the *cosmological proof* of the existence of God. Man alone is self-conscious; he alone, unlike the whole of irrational nature, knows himself to be a personal being; he alone is conscious of moral obligations and responsibilities which he often fulfils in

32 See Hipler, *Die christliche Geschichtsauffassung*, 1884, p. 13, seq.

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opposition to his own nature and to the world around him. By being born with head erect he is destined to gaze upwards from earth to heaven. Nor is this all. In his soul there is a presentiment of the Infinite, a desire of the supernatural, supreme good. Whence comes this divine element in man which illumines his soul with light from above? Whence, but from the Infinite, from God Himself? All other causes have been weighed in the balance and found wanting. Thus, for the fourth time, we stand face to face with a *first cause*. But nothing short of absolute intelligence, liberty and personality can be the cause of a conscious, free and personal being. Intelligence in man proves the spiritual nature of his absolute first cause; conscience in man proves that the first cause is absolutely good, loving and holy. The personality of the human soul forbids us to conceive the absolute spirit as impersonal.[33] Such a mode of contemplating God may be inexact and imperfect like all our knowledge of God, but it cannot be false if human knowledge, which is *ad modum cognoscentis*, can lay any claim to truth. We are fully aware that knowledge of this sort needs to be modified; but modification is not negation. When we refer the organic world back to God we infer, not that God has a vegetative and sensitive life, but that God, being the giver of life, must have life in Himself and be life. Nay more, we insist that God's life is of a more exalted kind, since the cause is higher than the effect, not in degree merely but specifically. The saying *causa æquat effectum* holds good only of natural forces; but this is not a question of natural force. The same is the case in regard to man. In investing God with an absolute personality we are far from intending to represent God as a magnified man. Here also the cause is specifically above the effect. It does not hence follow that the word "person" when applied to God and man is taken in precisely the same sense (*univoce*) in each case. God is a person in a more eminent sense than man. Nevertheless the analogy is quite correct.

33 Secchi, *Einheit*, vol. ii., p. 356, seq., *Schöpfung*, p. 28. Pohle, p. 121, seq. Kleutgen, *Phil.*, vol. ii., p. 774. Kuhn, *Gotteslehre*, p. 680. Storz, p. 159.

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CHAPTER X.

DESIGN AND PURPOSE.

Design and Purpose dog man at the heels through life. In all his actions man has a definite aim, and selects means proportioned to the level of his aim. The attainment of the end he has in view is the purpose of his actions and of his life. Purpose is the final cause (*causa finalis*) which determines man to do an action or to leave it undone. Having in the last chapter learnt to know God as the absolute reason, we might feel tempted to apply this principle also to Him. For the supreme reason must needs act rationally, that is by design. This course of procedure seems all the more commendable, as it will fulfil the two laws of human thought in the junction of the analytic and synthetic methods. S. Athanasius joined analysis with synthesis in this way in order to avoid one-sidedness, and to strengthen the proofs for the existence of God on both sides. But, for the Apologist, the other course seems preferable. As human reason is not vouchsafed an actual insight into the inward being of God, it must, in the question of finality and purpose, have recourse to the synthetic method and to *a posteriori* proofs. The two arguments often run in parallel lines, but each has a different aspect. Hitherto we have been enquiring whence came this universe and its several parts. We now pass to the question, *wherefore* it exists. Naturalists and philosophers share the work between them. The former merely searches for causes, the latter aims at connecting the phenomena that unfold God's power and wisdom. The naturalist is not

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on the lookout for purpose and design, as they lie beyond his horizon ; but they grow out of his work as naturally as the fruit grows on the tree.[1] Darwinism completely ignores final causes, but by its theory of adaptation it has, quite beyond its intention, rendered yeoman's service to the doctrine of design. Natural philosophy applies it to Teleology. Of course the philosopher may not overlook or deny the efficient causes. Efficient and final causes necessarily pull together. Final causes by themselves can only construct an ideal world without explaining the real one. To thrust one or other into the background is to be as biassed as the materialist who sees the material world and shuts his eyes to the world of spirit. By neglecting the efficient and exaggerating the final causes, the Schoolmen, especially their inferior representatives, made the real world difficult to understand and brought finality into discredit.[2] Materialists, on the other hand, by cutting design to pieces have stabbed civilization with laughter.

It is idle to enquire whether the design in nature is real, or a phantom that we have conjured up by reading our own thoughts into things. As empirical facts must be judged in accordance with the laws of thought, the design must be real. Look where we will, the star of purpose is in the ascendant. It lights up the beauteous structure and harmony of the heavens, the ingenious contrivances by which animals and plants feed and propagate themselves, and the world of wonders that the telescope discloses in the firmament, and the microscope in every speck of matter. Through all nature there shines a purpose of dazzling brilliancy, beside which art is as a rushlight compared to the sun. Aristotle had endeavoured to clothe this truth with light. The human mind, being an orderly faculty, is bound to unravel nature's riddles. At all times nature intends the best. All that is most perfect and answers the purpose she utilizes ; all that is purposeless and useless she rejects. She has, moreover, the faculty of pressing

1 Kleutgen, *Phil.*, vol. ii., p. 381. Pesch, vol. i., p. 354, seq.
2 See Commer *System* II., p. 96.

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things accidental into her service and assigning them a place in the world's economy. Nature's foresight proportions the parts to the whole, adjusts the relations between bulk and quantity, stocks the egg with food for the animal, provides the mother with milk, and implants in animals the impulse to rear their young.[3] Job, the Psalmist, and other sacred writers love to dwell on the beauty and design in nature, and are loud in the Creator's praises. The authors of the Sapiential Books extol the glory of the heavens, the splendour of the blazing stars, the harmony of the spheres. The beneficent light of sun and stars, the majesty of the storm, the change of the seasons, the beasts of the forest and the flowers of the field were ever inspiring these holy seers to sing the praises of Him who made them. Our Divine Lord Himself loved to borrow His most beautiful and instructive similitudes from nature. The lilies of the field that neither labour nor spin and yet surpass Solomon in his glory; the birds of the air that neither sow nor reap nor gather into barns, and yet are provided by nature with food—these are simple but telling instances of the intelligence and goodness that reign in nature. The fate of the seed that is sown, the cockle among the wheat, the good and bad fishes enable us to picture and understand higher truths that are overhung with mystery. It were an endless task to give in detail the noble descriptions of nature with which the contemplation of the external world inspired S. Basil and other Fathers who in their lives were so unworldly.[4]

The progress of discovery has tended to deepen this idea of purpose. The discovery of America disclosed to the wondering gaze of the astonished European entirely new fauna and flora; the marvels of the tropics greeted him in Southern Asia; in Australia and its cluster of islands he encountered strange forms which gave a finish to nature's picture. The Copernican system set the unity and sim-

3 See Hertling, *Materie und Form*, Bonn, 1871, p. 96. *Nat. und. Offenb.* 1879, 1885, pp. 99, 173, 221.

4 See Zoeckler, *Beziehungen*, 2 vols. Lorinser, *Das Buch der Natur*.

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plicity of the universe in a new light. The telescope revealed to the astronomer new worlds in the vast ocean of the heavens, new constellations in the nebulæ, new evolutions in the stars. From the spectroscope we learn that the unity of the system and of the moving forces is founded on the unity of the elements. The microscope showed a drop of water to be peopled with minute animalculæ, and gave geologists a clue to the formation of the rocks. Man now stands on the verge of two precipices—the infinitely great and the infinitely little. He stands in awe of both infinity and nothingness, and he is equi-distant from both. What is man in nature? Compared with the Infinite he is nothing, compared with nothingness he is everything.[5] Poets and religious writers admire nature; naturalists, by exploring the laws and forces that govern things great and small, are nature's panegyrists. The works of Copernicus, Kepler, Galileo, Newton, Linnæus, Cuvier, Alex. von Humboldt would form a bouquet of nature's choicest flowers. The hymn of praise which these men sang to the Creator of the universe added lustre and dignity to their pioneering efforts, and set a consecrated seal on the works of their genius. Let us now enter into their reasons and learn their results.

Many a poetic utterance has been choked by the scientific research into nature's phenomena; but nowadays the public ear is deaf to all things else. For we have no longer to deal with Ionian philosophers, who denied finality in nature, nor with Descartes and Bacon, who transferred it to a being outside the world. But our wrestling is with men of profound earnestness and immense industry, who strive to explain all finality in nature mechanically. Conscious purpose and design are to be superseded by an iron law of nature,—a mechanical necessity, determined solely by the forces in matter. Thus the universe is set down as a machine whose wheel and axle are ever revolving and working out their end by blind necessity.

5 Pascal, *Pensées*, *II.*, 22. Lotze, II., 63. Zoeckler, *Gottes Zeugen im Reiche der Natur*, 1881.

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Here, as in the cosmological argument, we must retrace our steps awhile. The great original nebula, with its matter, force, and motion is supposed to be the substratum from which the world has been evolved. But the question is: Was the world evolved according to a pre-arranged plan? Or has its present form emerged from the process by the sheerest accident? Has accident so formed this world alone out of millions of possible worlds, whose chances were equally great? According to the theory of Kant and Laplace the present universe has come forth mechanically from an original mass of matter having the property of motion. The speed of the rotating mass was accelerated by the radiation and condensation of the heat, and thus the centrifugal was in excess of the centripetal force. By degrees some parts of the mass were detached. The force of gravitation imparted to these a similar motion. The same process was repeated until at last the solar system with its planets and moons, nay the entire universe with its myriads of stars was formed—if, indeed, it be yet formed. Maybe evolution is still going on in the vast heaven. At first the masses were an incandescent gas, and then an incandescent liquid. When the masses gradually cooled a crust was formed. Eruptions often burst it open again, but finally it set, and the surface acquired a permanent solidity. Experience seems to bear out this theory. For the earth's surface has been materially changed by the revolutions of the earth.[6] The earthquake that levels mountains, the catastrophes in the Indian and Australian archipelagoes that form new islands and swallow up old ones, the smouldering volcanoes that are fanned into fresh fiery activity,—these are some of the results due to the earth's revolution. Then, again, water has been a mighty force in the configuration of land. In historic times, rivers and seas have been spread over wider areas, and have changed their course; some lands have been raised above the sea level, and others have been sunk be-

6 See *Controverse*, 1886, p. 511.

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low it; some islands have been severed from the mainland, others have been joined to it; in some places the sea has encroached on the land, in others the land has driven back the sea. When the earth was in a liquid state fire and water struggled for the mastery. In this duel between Pluto and Neptune the earth was knocked into its present shape. Everywhere mechanical forces are doing their deadly work. Analogy would lead us to conclude that the other planets, the moon, and the sun itself had undergone a similar process; and the spectroscope establishes the truth of the analogy. Formerly the sun was thought to be a solid dark nucleus with a luminous atmosphere (Nic. de Cusa). The discovery of sun spots seemed to bear out that view. But it is now believed that the sun is a glowing gaseous body, a gas ball only a little heavier than water. The metals revealed by the spectrum must be in a gaseous state. In former times temperature was higher: this fact points to a wider extension of the gaseous mass. At present there is nothing fixed and constant in the sun; all things are in a state of flux and formation. With the moon it is not so. Here motion has come to a standstill; there is no water, no atmosphere. Repose and death reign supreme. The moon is like an extinct crater, a ruin of the olden time. The earth with its firm crust and restless interior holds a middle place between the two. It has long since lost all light of its own and, like other planets, borrows light from the sun. But the inflamed state of its bowels points back to an earlier period, although the part of the original incandescent mass which they have retained has been gradually cooling. Thus in the sun, earth, and moon we have three links in the chain of solar evolution. The proof, however, is not so easy in the case of the other solar systems. But the evolution hypothesis best explains the different spectral colours of the fixed stars. Modern science is no longer afraid to maintain the unity of elements, atoms and matter as well as of the physical forces of nature. A real distinction used to be drawn between solid and liquid elements and pure gases, but the so-called

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permanent gases (oxygen, hydrogen, &c.) have since been converted into fluids. Moreover, the direction of planetary motion can be deduced far more naturally from the motion of the primitive mass, than from Newton's theory of an initial impetus given to each individual body. To the mathematician Laplace this seemed an all-sufficient reason. But while he confined his attention to our solar system, the natural philosopher Kant extended the theory to the whole universe. If too, as was shown above, all order and harmony are to be buried in final chaos, it would seem that there cannot have been design or purpose in that part of creation which has always called forth the admiration of mankind. There is a story told that the first Napoleon once asked Laplace if he had found God while exploring the heavens, and that Laplace answered : Your majesty, there is no need of that hypothesis. The anecdote, however, is said to be false or at least inaccurate. Shortly before his death Laplace besought the editor to suppress its publication.[7] Still it was believed at the time, and moreover it was found to tally with Laplace's principles.

But in truth it is not so. The mechanical theory, even in this its stronghold, is insufficient to explain the finality of evolution. The Kantian theory (which in its main outlines is found in Buffon) is at one with Newton's theory[8] in the matter of efficient and final causes. Laplace examined it mathematically and applied it to the solar system. It should not, however, be forgotten that it is only an hypothesis. True, it is highly probable, but for all that it is still wrapped up in the swaddling clothes of an hypothesis.[9] Geologists and mathematicians are not wanting who look askance at it. Even those who regard it with an eye of favour do not disguise the fact that it is still handicapped by serious difficulties. Thus the two main forces could not have produced the direction from West to East.

7 *Controverse*, 1885, p. 361, No. 1.

8 See Liebmann, *Anal.*, p. 356, seq.

9 See Pohle, vol. ii., p. 74. Pfaff., *Die Entwicklung der Welt auf atomistiche Grundlage*, Heidelberg, 1883. Braun, *Natur und Offenb.*, 1884-5, Epping, p. 49.

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There is no reason why that direction more than any other should have *happened* to ensue. In the beginning attraction was the only force at work, otherwise the mass would have been scattered into infinite space. Somehow, perhaps by heat, the force of repulsion was paralyzed. Again, if all the atoms were in the same condition, how came there to be centres of condensation? Yet only condensation could raise the heat to white heat, and prepare the way for the separation of luminous bodies. The formation of rings is exceedingly hard to explain physically by the two forces, whether with Laplace we consider them as the transition stage in the evolution of the several planets, or with Kant we look upon them as nothing extraordinary but as akin to comets—an opinion which would be fatal to the theory. Hence scientific men no longer regard the formation of rings as necessarily a transition stage. They are content to take the simple fact that masses were thrown off by the aerostatic propulsion of gas.[10] What caused the masses to be detached? It is difficult to assign any cause. The centrifugal force could not possibly have gained the upper hand in the rotating mass. On the contrary, the ball must have become more and more concentrated, finally settling down into a large body, spherical in form, firm in consistency and flattened at the poles. How could these masses lose their equilibrium, and tear themselves asunder from the grip of that all-powerful major force? Epping's explanation falls short, according to which the tangential motion was increased when the outer strata condensed by radiation. Descartes' circular motion rather supposes than explains rotation, which consists in a whirling movement. Thus one of two courses is open to us: either to assume a further impulse, or to retreat behind an explosion of gas. The maintenance of the direction of movement is as easily explained by the law of gravity as by the continuance of rotation. Yet even on this point there is room for dissen-

10 Braun, p. 519. Forster, *Studien zur Entwicklungsgeschichte des Sonnensystems*, Stuttgart, 1885. Rethwich, *Der Irrthum der Schwerkraft Hypothese*, 1884. Isenkrahe, *Idealismus oder Realismus?* Leipzig, 1883, p. 60, seq.

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sion. According to Kant and Laplace the most distant planets are the oldest; in the opinion of Faye and Forster they are the most recent.

The latest news from the moons of Neptune and Uranus is that no persuasion will entice them into the theory. The moons of Mars, one of which revolves round Mars in less time than Mars revolves on its own axis, have also joined the strike. And yet in their case, just as in that of the earth and moon and sun and planets, it is clear that it is but a repetition of one and the same fact that took place at the time of the original separation. Of course the comets have their own paths. Nevertheless they may be of cosmic origin, and some chance may bring them into our solar system. Some of them are known to have periods. There may be no doubt as to their connection with shooting stars, but this only shows that it is not all plain sailing with the mere fact of gravitation. An effort is now being made to prove that the retrograde motion of the satellites of Uranus and Neptune is due to the direction in which the planets around which they revolve move. According to the second and third laws of Kepler, the embryo-nebulæ of these planets must from the beginning have been endowed with dissimilar motion in proportion to the distance of the parts. In the process of condensation the further and slower portions fell from the centre of the potential nebulæ a little to the West, the others to the East. Hence arose the backward rotation of the new star.[11] The other satellites move forwards because there was scarcely any coherence between the particles of gas; but in Uranus and Neptune the particles were already somewhat united, and followed one another as in our atmosphere. Our planetary system includes two distinct regions: the one stretching from the centre to Saturn, the other from Saturn to Uranus, Neptune and onwards. To these regions correspond two periods of formation. In the first the planets with their satellites move forwards. When these were formed the

11 Faye, *Sur l'origine du monde*, Paris, 1889. See *Controverse*, 1885, p. 225, seq. For Laplace's expression, see *Introduction à la Théorie des Probabilités*, p. lxxii.

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matter was still scattered and in a condition of circular rotation ;* the sun was not yet a fixed central mass. In the second region the planets with their satellites have a retrograde movement. These were formed, says Faye, when the sun was finally constituted. It is easier to understand the difference in the time of the revolutions of the planets and their satellites, if we allow with Braun that the planets were thrust off as centres of condensation ; but in this case the explanation of the system as a whole loses its unity. Neptune's furthermost ring would help to explain the retrograde motion of its moon. Laplace built his theory on the supposition that the planets move in the same direction and in approximately the same plane. It is an exaggeration to say that Laplace offered to bet thousands of milliards against one that any new planet discovered would move forward. He merely wished to show that, according to the laws of probability, the oneness in direction of the planetary motions known to him could not be the work of chance.[12] Now it was precisely the strict unity of movement that formed the groundwork of his system. The law of probabilities tells most distinctly in our favour. The probability of chance imparting a similar position and direction to two-hundred-and-seventy planets is in the proportion of 1 to 10^{270}. By leaving the satellites out of the question, the theory has the advantage of not being complicated by exceptions, but then a legitimate doubt may be raised as to the validity of the premisses. The possibility of some other influence is thereby admitted.

Granting, however, that the theory is highly probable, and a substantially correct account of the origin of the universe, we still must insist that mechanical causes are inadequate. It may have been a matter of perfect indifference what direction motion originally took. But the separation of the several masses, the unity in direction and the similarity of position that obtain throughout our solar system

* See Descartes.

12 *Exposition du système du monde*, p. 343. *Controverse*, 1815, p. 785, No. 1.

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cannot be work of chance. Sometimes the rotation is accounted for by several balls of gas instead of one. These are supposed to have rushed one on the other and, as they did not always meet in the centre, to have given an impulse to rotation (Braun). On this supposition, however, the similarity in direction of the whole is still more puzzling, for it would rest on a most improbable assumption, viz., that the several balls of gas had united into one. Had this taken place, on the falling of new balls or nebulæ, no cause would exist for the stronger movement of the outside strata and their final separation from the mass. The similar direction of movement will ever remain a mystery if the slow rotation of the sun (25 days) and the greater rotation at the equator can only be explained by the introduction of such nebulæ. Gravitation would have brought it to a dead stop. We must therefore conclude that the mass was endowed with rotation, and that the direction and terminus of its motion was pre determined.

Mechanical forces and the unchangeable laws of nature are, it is true, the only factors with which we have to deal in Astronomy, Physics, Chemistry and Geography. Could the whole universe have been evolved by these simple necessary laws and mechanical forces? In modern mechanics the term "living force" is used to denote the potential energy and the capacity for work of a moving body, measured by its mass and velocity. The expression, though figurative, is founded on analogy. It shows how several bodies moving at different velocities interact on one another according to their mass and distance. Elements and bodies act only in conjunction with other elements and other bodies, and in a manner suited to their different external conditions. Interaction alone gives actuality to force. Attraction and repulsion, pressure and counter-pressure, action and re-action are reciprocal. The effect is modified, accelerated or retarded, as the case may be, by circumstances. In every mechanical process the reciprocal relation between the distance and the intensity of the accelerated forces must be taken into account. And

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the energy of moving bodies is produced, increased or decreased accordingly. No mere relative change of place will explain a phenomenon like this, which transcends the simple necessary motion. Under the same circumstances the same phenomenon always recurs, although mechanics can give no reason for the ever-recurring regularity—an inability all the more significant as the same regularity prevails throughout the universe in things both great and small. Amid thousands and tens of thousands of possibilities one effect would in all likelihood counterbalance the other, if all were under the sway of chance. To ensure permanent and regular action in a definite direction, an arrangement from the first start is indispensable; the elements must be co-ordinated and mutually dependent on one another in a manner suited to their different natures. It is preposterous to suppose that all the elements would subordinate themselves to an internal connection, unless a higher force had instilled such a disposition in their nature. When any part of a machine is out of order, it is either cast away or withdrawn till repaired; otherwise the machine is damaged and ultimately breaks down. What is the best appointed machine compared to an universe governed by one inexorable law of motion, which all bodies, great and small, far and near, are bound to obey? Laplace once observed that with any other arrangement in our planetary system a collision would have been inevitable. In 1847 Le Verrier proved the existence of a more distant planet, merely by forming a calculation based on the received laws of astronomy. Shortly afterwards the discovery of Neptune brilliantly verified his calculation. Assuredly it is putting too tight a strain on our credulity to ask us to see the work of chance in this wonderful mechanism of the heavens which, by reason of its mathematical exactness, is the model of all mechanics. As the universe is inconceivable without an efficient cause, so it is equally unintelligible without a purpose or final cause. In themselves and in their being, the forces of nature are unknown to us. The laws of nature are abstractions of the mind founded

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on the regular march of events. Some like Marriotte's law about the pressure of gases have been swept away by recent discoveries; others have been greatly modified; others again have been so diluted with exceptions that their strength is gone.[13] Still, even if these weak points did not exist, laws of nature would be but mental formulæ for expressing natural phenomena—formulæ, too, obtained by an incomplete induction, and not wholly free from *a priori* statements. They leave the *why* and the *wherefore* in a total eclipse. They are hollow words and sounding names, though they be systematized and welded into a logical whole. Their sole *raison d'être* is to be means to an end. They serve to work out the ideas that underlie things and govern their development. "If we always required to "know *why* things are as they are, no astronomical or phys-"ical knowledge would be possible."[14]

Modern Science has confirmed the conjectures of the ancients. The active substances that work together in nature, and the laws that regulate nature's course are so disposed that the most admirable adaptation to purpose is visible in their normal results. The elements (about 68) form, as it were, a periodic system, from a theoretical examination of which Dr. Mendelejeff was led to suppose the existence of other elements hitherto unknown. Already there have been discovered: Gallium in 1875, Scandium in 1879, and Germanium in 1886. Even the law of the conservation of energy—that greatest triumph of empiric philosophy—can but serve to increase our admiration. Every force in nature's storehouse, even the smallest, must do its share of work in one form or another, whether as mechanical motion, or the motion of heat or light, electricity or magnetism. The matter and force of the universe have been fixed once for all, both as to quantity and quality. How can chance or necessity have caused all the forces of nature to work together for a common end? An unbroken chain of mechanical causality stretches as far as

13 See Schneider, *Geisterglaube*, p. 337, seq. Liebmann, *Anal.*, p. 248, seq.
14 Nägeli, *Abstamm.*, p. 581.

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the eye can see ; but we see only the outer connection not the inner reason why all the agents pull together. "Chance" is a synonym for ignorance ; necessity finally leads to purpose ; for that which works from necessity, works according to its nature for some predetermined end. The necessity of causality need not therefore prove a stumbling-block. Before necessity begins, a force with a purpose is already at work, which links the necessities into a chain and sets them in motion. The coupling is correct, and the end is surely attained ; therefore chance is ousted and necessity is proved to be the handmaid of purpose. The events due to mechanical causality, when linked together, give still greater prominence to purpose. For their union postulates a mechanician who so apportioned the forces of matter as to produce an harmonious world. How the teleological and mechanical principles are to be combined is merely a matter for explanation. That such a principle, however, underlies all motion and machinery no one will deny but those who have stared so long at the mere outer effects that they are blind to the working of the machinery as a whole. The workman who toils from year's end to year's end at the same part of a machine loses sight of the bearing of the parts on the whole, and at last comes to see himself as part of a machine in nature's workshop. So it is with the discoverer who is ever gazing too steadfastly on the external side of natural phenomena. He holds the several parts in the hollow of his hand, but is too short-sighted to perceive their unity as a whole. As the watch presupposes a watchmaker, so this wonderful world presupposes a maker. Even Voltaire could not gainsay the justice of this trite comparison. The great Creator showed His wisdom by making the several forces work for the common end according to fixed laws. When once set going, there was no need for God to be always at hand to steer them. Thus the Creator's wisdom shines forth more resplendently in the theory of Kant and Laplace than in other theories which require the constant interference of the Creator in each separate planet and at each stage of

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development. This truth, Braun thinks, should be proclaimed from the house-tops to those men of overflowing faith who are always imagining some new interference.[15]

A stream of purpose runs through the action of the beneficial forces of nature even in the smallest details. What a power is heat in nature's household! The motion of air and water, the state of rivers and lakes at different seasons is regulated by heat. A second striking exception has recently been discovered to water attaining its greatest density at $2\frac{1}{2}^{0}$ (4^{0}); but we do not marvel the less at the admirable manner in which rivers and lakes are thus prevented from being completely frozen. Nor is this peculiarity of ice-formation less wonderful in its effects on soil and on arable land. By its action even unhewn rocks are gradually made accessible to cultivation, and the clods of earth open out to its benignant action. Not only for cultivation, but also for man's clothing and nourishment heat is all important. Water, too, is likewise indispensable for plants, animals and man. It regulates temperature, returning from the sea as vapour where it had fallen as rain. And this vapour is restored to the earth through the agency of plants. For the coolness in the atmosphere requisite for the formation of clouds is produced by the evaporation that is going on in the forests. Thus a connection is established between water and the atmosphere. Of the service rendered by the air to organic life we spoke above when treating of adaptation in general. Does adaptation account for the composition of the atmosphere? Just as much and just as little as it accounts for the air-passages on the lower side of leaves, and for the different breathing organs in animals, ranging from the tubes (*tracheæ*) of insects to the lungs of man. To deny purpose here is to abandon all hope of fathoming the reason of things.

But the rightful home of purpose is organic nature. The very word *organism*, now so current in speech, is itself suggestive of purpose. For it signifies a structure whose

15 See *Natur und Offenbarung*, 1885, p. 172. On Mendelejeff ibid. 1883, 1887, p. 55.

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parts or "organs" work together in harmony to fulfil the purpose for which the organism exists. The delicate structure of the plants both gives the needful consistency and permits the sap to circulate freely. The flexible skeleton of the animal is supple or firm according to its habits. It supports fibres and muscles, sustains and sets the whole body in motion, and, in spite of apparent disadvantages, admirably satisfies the varied needs of living beings. All the parts work together for the common good. The greater the insight we gain into the exact sciences, the clearer the truth grows that we must look to the animal organism for the most perfect application of the laws of mechanics. The principle of the lever is seen in the animal body only, and that in an act of the animal peculiarly and distinctively its own, namely, external and internal motion. The animal's motive organs are perfect in structure and unsurpassed as a model for machinery. In the symmetrical build of the skeleton, Cuvier discerned the model of architecture. Now it is known that plants and animals are constructed on mathematical laws. The arrangement of the boughs and leaves on the tree follows the law of the "golden mean." The same law is the formal principle which regulates the limbs in man and animals. The formation of the organism unconsciously determined the formation of the *artefacta*, and these in turn have thrown a light on the formation of the organism.[16] The same idea, with gradual modifications, pervades all structures. Few elements comparatively have a share in the formation of plants and animals. The foundation is piled on four elements: oxygen, hydrogen, carbon and nitrogen. As all words and sentences are made up from the twenty-six letters of the alphabet, so in the organic kingdom the combinations of the elements are countless. And, it may be added, as no chance could ever succeed in producing from the 26 letters an *Iliad* or an *Odyssey*,

16 Reising, *Neue Lehre von den Proportionen des menschlichen Körpers*, Leipzig, 1854. *Der goldene Schnitt*, Leipzig, 1884. Pfeiffer, *Der goldene Schnitt*, 1885. See Pohle, II., p. 195. *Natur und Offenb.*, 1885, p. 628.

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so neither could chance shake these elements into an organic being.

A close examination of organic life will show that necessity in nature is always subservient to purpose. Inorganic nature has to supply the plants with food; the cell-wall, roots and leaves have the power to seize and retain the food. The plant that grows on gravel requires different food to the plant that grows on chalk. The soil, however drenched with rain, has the property of retaining the requisite materials; the roots suck up the materials in solution that are most adapted to the nature of the plant. The animal, in like manner, provides itself with congenial food. The food having been ground down and kneaded by appliances with which the animal is furnished, when moistened with saliva is carried down the œsophagus into the stomach. The mucous membrane of the stomach secretes the juice (pepsine) which converts the food into chyle, while the food is thoroughly mixed and churned by the peristaltic movement of the stomach. The nutritious matter passes through the stomach and, with the aid of the gall and the juice of the pancreatic gland, is formed into chyme. Then it is sucked up by innumerable pipes and vessels and conveyed to the blood. Only the indigestible remnant passes through the abdomen. Thus a complete set of complicated apparatuses is working harmoniously for the purpose of nutrition. Similar provision is also made for the processes of respiration and reproduction. In contemplating the several organs and functions one by one, we see the general laws of chemistry and physics in action; but they are so admirably connected, and follow one another in such perfect order that they must be held together by a mysterious bond of union. An invisible hand seems to lead them along their path and marshal them in order. This is the case with every individual of the animal kingdom after its kind. And, in an analogous way, it is true of the vegetable kingdom also. Is this a mere machine? In truth a wonderful machine, that works true of itself, is self-supporting and self-winding!

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that can provide a change of matter to repair and strengthen its levers and joints! Every one is familiar with the old comparison of the lighted taper. The flame of life is kept burning by the fuel that mouth and stomach supply. In a burning taper oxygen and heat convert carbon into carbonic acid. There is nothing in this operation that is not constantly going on in our lungs, with simpler means. But this does not explain even the arrangement of the breathing apparatus, to say nothing of the greater and lesser circulation of the blood. The chemical process exists indeed, but in a system of living forces where it serves as a means to an end. So, again, the inertia and the compound forces of bodies work mighty results in the inorganic world; but they are immeasurably inferior to the simple functions of life which enclose in their bosom the principle of motion and the end of their action.

This peculiarity is chiefly conspicuous in those actions which are connected with spontaneous movement. Certain plants seem destined to be the food of certain insects. The insect flies to them, although it may have never seen them before. The water-animal at once rushes to the water; the land-animal roves on land. Herbivorous animals go in search of grass and vegetable food; the carnivorous lie in ambush or go on the chase. How wonderful in many cases are their expedients for obtaining their food! the artful cauldron, for example, in which the ant-eater catches its prey, or the web which the spider spins to catch the buzzing fly. Pleasure and need go hand in hand. It may be that the spider is but following an impulse when it draws the threads from its glands and twists them into the finest web. Is it not, however, wonderful that, when gratifying its sense of pleasure, it at the same time displays great artistic skill and spins organic contrivances for catching its prey? The mere feeling of pleasure might be satisfied by the mere spinning of the threads without art and without contrivance. But the artistic web, which is different in different kinds of spiders, can be understood only in the light of a specially prearranged

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disposition and purpose. That the spider is prepared for the purpose is shown by the fact that it lurks in the background ready to spring forth like a robber, as soon as a passing fly is carelessly entangled in its meshes. A bite or two deprives the prisoner of all power of resisting, and the prey is then safely stowed away. The actual purpose is undeniable. Are we not justified in concluding that there is also an ideal purpose? And yet this is but one out of countless facts in the insect world that shadow forth a purpose. This is the key to unlock the mysteries of insect life. No mechanism or adaptation will account for instinctive actions. A sublime purpose shines through them all.

The life of the individual is designed to preserve the species; the species answers the same purpose towards the family, the class, and the entire kingdom. Through all the processes of animal and vegetable life there runs a law which guides them towards the highest degree of perfection allotted to the species. In inorganic nature accidental causes are everywhere set up for the rise or fall of individuals. The stone remains unchanged till acted upon by external causes. Water scoops it out or rolls it away; acids dissolve it. The triple alliance of atmosphere, heat and cold loosens its parts. In like manner chemical and mechanical forces are changing the face of the earth. In crystallization some kind of inward activity is perceptible. In the different sorts of crystals the elements have to be specially arranged. But, after all, the result is mechanical. Everything depends on juxtaposition, although the kind of crystallization may be at times determined by the intensity of the heat in the molecules (Dimorphism and Trimorphism). Another and a deeper reason lies in the condition and attractive force of the atoms and molecules. Purpose cannot be easily banished altogether from inorganized nature, as any one will allow who reflects on the different forms of carbon, coal, graphite, and the diamond.

Organic beings, too, are at every moment exposed to the impressions and influences of their environment. But they have the power of resistance and defence in them-

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selves. The changes in their condition are wrought by the vital force within them. They grow, develop and perish, but they have not existed in vain. The plant germinates and grows, blossoms and bears fruit in due season in order to impart its life to others. From an invisible embryo the animal passes through a series of stages of growths. The higher it gets the more slowly it propagates its like. Then when this end of its existence is fulfilled, it vanishes from the scene sooner or later, and sometimes at once like many insects. Birth and death, *generatio* and *corruptio*, are ever the goals of organic life; they are founded not on adaptation, but on an unalterable immanent law."[17] Then again every species follows its own law of development. The organization of every creature struggles on bravely and persistently till it has climbed to the summit of the species. This persistent struggle reveals a plan stretching far and wide beyond the present actual limits of nature. On every step of the journey from germ to blossom and fruit, new possibilities arise, which are none the less wonderful because we know the intermediate stages. For the species and manner of the growth, and the certain law that governs it, cannot be explained by the slow process of development. No chemical or physical force can give the organism an opposite tendency. All changes affect the parts, not the form of the whole, which endures after the life of the individual. The germ forces the elements taken from its surroundings to enter into certain combinations with one another so as to produce a structure similar to itself. This law, to mechanics a stumbling-block, is in force throughout the organic world. No reason whatever can be given why living matter should assume different elementary forms: why it should shape itself at one time into leaves and twigs, blossoms, fruit and thorns, and at another into muscle, nerve and bone, hair and nail. Nor do we know why these should blend with other groups of cells into an harmonious unit. On any other theory it is aston-

17 Weisman, *Ueber Leben und Tod*, Jena, 1884.

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ishing, nay incomprehensible, how a species has never appeared twice, even in the most distant times and climes. In the development of every species there is a beginning, a zenith, and a nadir. The biogenetical law, so much insisted upon in the doctrine of descent, merely shows that one and the same plan underlies the evolution of species and individuals. In this very fact, so thoroughly in keeping with the general character of the Cosmos, we admire the Creator's wisdom in forming individuals and species according to the same idea, and in combining unity and variety for the same end. By forming species into families and tribes, orders and classes, we may pursue this train of thought through the entire organic world. The "natural system" that is to embrace both the animal and vegetable kingdoms has not yet been invented. But it is universally felt that artificial systems are only a makeshift till a natural system is found. Nevertheless we can see a grand common plan peeping through the chinks of even artificial systems. Thus the Linnæan system of Botany is a spacious mirror reflecting the guiding hand of purpose in nature's tendencies. The succession of nineteen great classes from monandrists to syngenists, is admirable in spite of the many variations. There is, too, a parallelism running through the orders. How could there be any system at all, most of all a natural system, if there is neither plan nor purpose in the organic creation?

Propagation being the end, and preservation of the species the chief task of the individual, it is not surprising that nature has made abundant provision thereto. On the fertilization of plants we have already spoken. The seeds also are well cared for. Hairs, lashes, cilia and crowns of flimmer facilitate their diffusion by the wind. Some are so strongly guarded that they retain their germinating power after passing through sea-water and the stomach of a bird. Capsules and husks are furnished with elastic bands which open the pods and scatter the seeds when they have come to maturity. Equally wonderful are the contrivances in the animal kingdom. Here the

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insect drives its sting into an apple, pear or cherry blossom ; there a wasp lays its eggs on a caterpillar, or on the branch of the oak or hawthorn. Just when the caterpillar is expected to emerge in a chrysalis, a whole army of living worms is at hand to spin small cocoons. And yet no one will describe these creatures as highly intelligent ! Their own nourishment is quite different from that which they give the offspring they are never to see ! What does the insect know of the purpose of the egg, or of the needs of the larva ? Following its instinct, it does its work and then dies. Many a caterpillar crawls from the tree to the ground or to a wall to end there its chrysalis life. The chrysalis waits patiently till it can cast off its integument. Then it passes a brief but happy existence as a butterfly and lays its eggs on a leaf. We do not now ask whence the living creature derived the power to do these things. But we are bound to ask, how comes it that the creature invariably takes the right turn on an unknown road ? How comes it that it always attains its end so surely unless some external obstacle besets its path ? Are not necessity and purpose here joined in the closest bands of wedlock ? Does not this conformity to purpose under the pressure of necessity far surpass the greatest efforts of human genius ?

We must not, however, be so narrow-minded as to imagine every minutest detail alive with purpose. We must also beware of confusing purpose with utility. It is not easy with Galen to see a special purpose in every muscle, nerve and ganglion. The precise function of some organs (e.g. the spleen) has not even yet been determined with certainty. Many mammals (horses, stags, elephants, camels) have no gall, and yet their digestion, as far as we know, takes no hurt. Monists allege rudimentary organs in proof that nature is often purposeless. But nature is not a niggardly hostess. Rather she is prodigal with blossoms, pollen and germs. The majority of new organisms perish. Do these facts prove that there is no purpose in nature ? Yes, if purpose is to be tried before the court of niggardly parsimony and inexorable utility. But nature

spurns them from her threshold. The man that has no ideal or æsthetic motives in himself, nor is moved by the concord of art and symbolism will never be fit to understand nature's manifold diversity. But he who sets a value on these ideal motives will see beauty in the flowers that stand out from the green meadow ; he will admire the contrast between the blue-eyed grass, the red poppy and the waving corn ; he will be struck by the harmony that subsists between the birds of the air and the trees of the forest. Such a man will not measure purpose by a two-foot rule of utility, but will be glad at heart to feast his eyes on nature's beauty. Often, however, nature's so-called prodigality is only apparent. How many insects, failing to find food in the overstocked world of flowers, try in their little way to establish the equilibrium in nature's household ! All refuse becomes fresh food for the plant. Individuals and organisms have a wider scope in a teleological than in a mechanical conception of nature. As all the organs, though relatively independent, work together for a common end, so an indwelling purpose must be in the organism as a whole. The whole, as Aristotle truly said, comes before the parts. The several parts of plant or animal are thoroughly in accord with the entire disposition and function of the organism. The whole determines the parts, not the parts the whole. Design not chance differentiates the egg-cell. Elementary parts grow because the whole is one. If the determining force mean no more than the resultant of the individual elements of the living unit, then the living unit or the individualizing principle would even so be the formal principle. Call it by whatever name we will, "instinct of preservation," "iron necessity," "governing principle," "idea," "perfecting principle," "constitutional cause," or aught else, unless these are empty names for an inexplicable thing, they will necessarily both imply and lead to purpose and design. In the order of execution the efficient cause is first and the final cause last, but in the order of intention, these are reversed. The determining stage comes last ; all others are but necessary stages of

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transition. Those Darwinians who admit an internal finality suppose a plastic tendency, a *nisus formativus*, in organic beings. To this no exception need be taken, provided it, too, be not explained by mere mechanism. Nägeli's idioplasmic dispositions may be made very serviceable. It is said that they are an ontogenetical repetition of phylogenesis and that they produce, in the same order, the same formation of leaves up to the pistil. They, however, lose all real value if idioplasm means merely the result of inheritance begun with spontaneous generation and continued through all the periods. If, apart from accidental and external influences, the change of idioplasm in all individuals, is a necessary change; if the tendency, growth and division of the plasma-cells is free from outer influences and effected by inner causes; if, moreover, higher species manifest new phenomena, besides repeating the phenomena of lower species; then we have a progressive series, with an object worked out from the beginning. To this we give the name of teleological development. The name matters little. Von Baer's proposal to substitute the word finality (*Zielstrebigkeit*—tendency towards an end) for "design" or "purpose" seems to be generally approved. The change has for its object to divest the term of all anthropomorphic meaning, and to safeguard the rights of mechanical necessity. As time goes on it will probably be shown that nature's laws are far simpler than has been supposed. Perhaps, too, natural science will succeed in explaining mechanically much in the organic world that a more "sentimental" theory has hitherto deduced from a teleological principle. Beyond this it cannot go. Men are so dazzled by the magnificent results of empirical science that they propose to surrender unconditionally to Monism. But this is surely, to say the least, premature since the depths of organic life are admitted to be at present inscrutable. Aristotle commended Anaxagoras for being the first philosopher to assert that "an intelligence is the cause of order and beauty in living beings, as in all nature." In these words he laid down a principle against which there cannot be an intelli-

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gent reaction. Still, of course, the same fate may often befall men nowadays that overtook Anaxagoras of old. He admitted, indeed, an ordering intelligence, but all his particular explanations were purely physical. For this inconsistency Aristotle takes him to task. In these days, however, there is more justification for such a course, because the physical explanation rests on a solid basis, and is the necessary groundwork of Teleology. Mechanics shows the means that nature uses to attain her ends. The end lies outside the province of mechanics; it is not, however, supernatural, but founded on the nature of things. A correct physical explanation, therefore, will mirror forth events, without resolving them into a game of chance played by the brute and unruly forces of nature. Even Darwin could never get rid of an intelligent principle governing nature. Chance gives no intelligent reason either for beginning or development, since it is not a *causa*; nor could it possibly create the actual objective order that is admitted to exist. Anomalies present no difficulty: for the abnormal merely bears witness to the normal. Like monstrosities, they prove that external hindrances may push the intended development of individuals off the lines; but they have no effect on the whole species. They perish as they sprang up. Countless combinations of existing elements were possible. From such a chaos only an intelligent being could have made the best selection; none but an intelligent being could have brought the conditions of development into the dependency necessary to lead up to the end. In his mind the struggle for life would be a plan for assuring the survival of the perfect in preference to the imperfect; it would be a means designed to throw light on each step in the ascending scale.[18] Hence this consequence of the Darwinian theory is now obtaining wide acceptance even among those who reject the theory itself. As far as we are concerned it is a matter of indifference whether immanent causes that work for a purpose are

18 Hertling, p. 69; Dressell, p. 101.

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called ideas, or *rationes seminales* (St. Augustine and the Platonists), or *formæ substantiales* (Aristotle and the Schoolmen). We need only insist that idea and reality, matter and form are not opposed to one another, but are the constituent principles of things. Throughout the length and breadth of nature there is an intimate connection between mechanical causes and design, which forces us, not to import finality from without, but to regard it as inherent in the nature of material things. Things have an *appetitus naturalis* for their own perfection.

This inherent finality, far from ousting the Creator who fixes the purpose, calls the more imperatively for his presence. In whatever light we view the question, order with purpose points to an ordering spirit; wonderful regularity proceeds from an intelligent lawgiver; organisms built up with artistic skill are the work of a great artist; the æsthetic beauty of form in the whole creation and in all its parts is the product of a master-mind.[19] Such is the conclusion drawn by reason and intelligence as well as by sentiment. The ideas faintly pencilled in things below foreshadow eternal unity, beauty and goodness; the harmonious unity, beauty, order and goodness in created things show forth the Creator of the one first principle of beauty and goodness. All things exist in form, measure and number. Out of these comes forth beauty. Unity, proportion and order are resplendent in all the elements; without them the elements would sink into nothingness. He is the source of this order who made all things in number, order and measure. Created things are a mirror that reflects God's wisdom, beauty and goodness, because in their form, order and measure they emanate from those divine attributes.[20]

It was a striking thought of the nature-loving Fathers to describe man as the goal of creation. Without man there would be no eye to feast on the wisdom of God revealed in the beauty of nature. What would the lovely

19 See Pohle, *Katholik*, 1883, p. 337, seq.
20 Augustine, See Storz, p. 175, seq.

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landscape avail without the eye of man? Of what use is the softest, silver-sweet music but to charm the ear of man? In man the purpose of nature attains its zenith. He can reflect on the thoughts of creative reason, and see and feel God's majesty and beauty. Every man, who normally develops, attains self-consciousness and a moral character. When man acts rationally, as a man, experience and logic tell us that he thinks and acts according to certain laws. And when he acts otherwise, he is gibbeted for acting irrationally, and he is himself conscious that he is so doing, whether he admit it or no. To reflect and calculate is to determine the end and to apportion the means. Even knowledge, in the last instance, is under the reign of law. The will may assert its suzerainty by fixing attention on certain objects, and by giving a direction to thought; but the regular course of thought it cannot alter. The laws of cognition can only be the offspring of the fundamental and eternal laws of intelligence. These, though unattainable by experience, set a rule and an aim to our thoughts. It would be difficult to affirm or to deny that the intellectual thought of the human race, as a whole, is tending towards a definite end. We might be tempted to deny it when we consider that all our spiritual knowledge reposes on Greek philosophy, and that Plato and Aristotle are still accounted our instructors in all knowledge. Theology, though dependent on revelation, is still a progressive science, especially when it allies itself to profane knowledge, and strives to harmonize faith with reason. But even here the present is upborne on the shoulders of the past; nay, more, in principle it has not advanced a single pace. As Plato and Aristotle are the goliaths of heathen wisdom, so SS. Augustine and Thomas are the unsurpassed coryphei of Christian philosophy. Nevertheless, the Christian philosopher will not despise or be indifferent to the teaching of modern science. The immense progress made by the "exact" sciences has laid a deeper and surer foundation for intellectual science, and has also given a better insight into the works of nature and the

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human mind. Man's knowledge will always be a piece of patchwork. Still, in spite of its numerous shortcomings, it is ever drawing nearer to its final purpose and end.

In the *moral* life, which is of special moment, two facts stand face to face: liberty and moral obligation. Man may be overpowered by brute force and chained down by circumstances; but his freedom peers through compulsion and moral force. He may be swayed by desires and motives, by passions and habits; he may act against his better knowledge and aspirations; but he is conscious that he can, or at least that he should, act otherwise. This very consciousness of weakness is a powerful incentive to prosecute that higher aim which is at the root of his moral life. He hears the categorical "Thou shalt" resounding within him, and he feels that the command is pregnant with authority. He knows that a higher aim has been proposed to man and, if he fall short of his aim, that more, to say the least, is to be exacted from man than from other beings. Of this higher destiny even evil is a proof. For the individual is conscious that all is not right, and is thus distinctly reminded that he has a moral duty to discharge. If the *ego* feels both free and subject to an inner law, there must be a superior will to whom it owes allegiance. So surely as this inner experience of conscience exists, it requires the higher world, to which man is destined, to be real. To the consciousness of moral obligation burnt in the human soul it is chiefly due that men are not actuated by savage selfishness, and that every man's hand is not raised against his neighbour. Not only is finality ingrained in the very nature and essence of man, but it is also the essential groundwork of morality. A powerful moral lawgiver, higher than man, is a necessary postulate of morality; in his will the end of creation is identified with the end of man.[21] The various moral convictions that actually exist, though the result of training and of outer and inner influences, have their roots fixed in the nature of the soul,

21 Kant, *Religion innerhalb der Grenzen der natürl. Vernunft*, Opp. Ed., von Hartenstein VI. p. 98 seq.

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to which a *moral ideal* is law. Ideals may vary with individuals. But the fact that moral ideals always come to the front and clamour for realization, points clearly to a supreme ideal of perfection that man cannot reach. The words of our Lord : "Be you also perfect as your heavenly Father is perfect" are characteristic of human nature at its best, and indicate the goal for which every man is to strive. The moral sense is a truer test of the nature of the spirit, and marks out the end of man more exactly than intellectual knowledge. In the life of man, moral feeling is a tower of strength. The countless heroes and martyrs of Christianity, the religious who practise self-denial and forsake the world, the angelic in innocence and sincere in piety, Christians loving their neighbour devotedly, and sacrificing themselves for the love of God,—all give testimony to the truth deeply engraven in the human heart that man was made for a better and a nobler end. Individuals constitute society as the parts go to make up the whole. No society can exist without law and order. But pains and penalties would be powerless to enforce an irksome law, were not the better members of society prompted by a sense of duty, and penetrated with a firm faith that to fulfil the moral law is to do God's will. Then punishments have, in the first place, a vindictive character, and are intended for the protection of society. Justice demands that wrongs should be redressed ; the public conscience demands the reform of abuses. But the redress and the reformation are rooted in the universal persuasion that the well-being of individuals and of society rests on a higher order of right, and on doing the behests of a holy will. How far the end is actually attained cannot be gathered from statistics. Much is withheld from the public eye ; evil usually thrusts itself forward, while good is screened from sight. But since man is free to choose right or wrong, wrongful actions cannot obliterate moral aim and purpose.

Evil is an engine with which men have thought to grind the wisdom and goodness of the Creator to powder ; a

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battery with which they have tried to sweep the purpose in creation out of existence. Misery and want are everywhere rampant both in the physical and moral spheres. This thought is eloquently expressed in many passages of Holy Scripture. Man, born of woman, lives for a short time and dies. Here, in a nutshell, is the history of every man's life. Frightful misery and suffering are the lot of many. Man, at his entrance into life, is more helpless than any other living being. His life, from the cradle to the grave, is beset with countless dangers. Ills of every sort lie in ambush for him. He is torn to pieces by savage beasts, and poisoned by noxious herbs. The elements vent their fury on him. He is tortured and put to death by his own flesh and blood. For man is man's bitterest foe. *Homo homini lupus.* Disease undermines his frame, and gradually plucks out life by the roots. And when death's forerunner has done his deadly work, death itself often seems a release. For the majority of mankind poverty and hunger are inseparable companions through life. They rise in the morning anxious where to find their daily bread. Through the heats of summer and the biting frosts of winter heavy toil and hard labour are their lot. In all ages, individuals, families and nations, yea the whole human race have been overwhelmed with an amount of physical evil and suffering that no one can contemplate without a shudder. But the moral wretchedness is often greater and always more disastrous. In his degradation man sinks far below the brute, and in this is clearly distinguished from the brute. The horrors of war and persecution, the outbreaks of hatred and enmity, the cruelty of tyrants and savages, human sacrifices and cannibalism, sins against nature, and all kinds of impurity reveal such a slough of vileness in the human heart that we can only exclaim with the poet:

> The horror of horrors
> Is man in his madness.

What now remains of purpose? Is there a remnant of rags and tatters?

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Had all these evils been ordained from the beginning, the question would be difficult to answer. But a tradition still lives among the most varied races that from the beginning it was not so, neither shall be for ever. The belief in a past golden age has never wholly died out. Individuals are often overtaken by physical and moral misery through their own fault. The two often go hand in hand. The different sorts of immoderate enjoyment usually sow the seeds of physical and spiritual decay. Certain widespread vices infect whole peoples and plunge whole generations into misery. Man is a social being, and he must take the losses as well as the gains of his position. The chief source of human misery is the abuse of free-will. Man deviates from his prescribed end which, if pursued, would conduce to the health of soul and body. Not all sickness, however, arises from personal sin. The innocent, it must be confessed, often suffer more than the guilty. But we know too, that the trials and sufferings of this life are sent to many for their greater good. Still this, though true of many, is not true of all. Besides there is a primary end underlying this secondary end of evil. Man's understanding cannot sift to the bottom the reason for the fate that thus weighs heavily on the human race. Such universal misery, however, as the general conscience of humanity testifies, must have been created by universal guiltiness. For a full and proper solution of the mystery of evil we must go to Revelation, which shows how little sin and its consequences militate against the wisdom and goodness of the Creator. In the beginning God ordained it otherwise, but the *free* will of man broke through the ordinances of God. Thus even man's physical nature assumed an unnatural aspect, and had to take its share of the consequences of sin. Had not spiritual death intervened, man's physical life would have been more cheerful. Still, sin and death notwithstanding, man has not been wholly forgotten and forsaken by his Creator. From the beginning God lit up the darkness and the shadows of death with the bright hope of redemption.

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He could not bestow on man the noble gift of freedom, without permitting its abuse. But He reveals His infinite wisdom precisely by twisting evil into His own designs, and by making it serve as a corrective in preparing man for redemption. Pessimism, as will be shewn in the following section, would be the true philosophy only on the supposition that this life were the end of all things.

The foregoing principles explain, in part at least, the physical evil that oppresses the world. To set down the present course of nature in its entirety as the product of sinful corruption would, doubtless, be a mistake; but there is no shirking the conclusion that the influence wielded by *sinful* man over nature is great. How much truth there is in the poet's words: Nature is beautiful in every spot untrodden by man. Forests are recklessly felled, and a change comes over the climate and fertility of the country. Streams and lakes are dried up, or canals and watercourses are cut; thus commerce spreads, and the configuration of the land is altered. Man's handiwork has changed the face of the earth in its fauna and flora.* Savage and civilized peoples act on nature in different ways. If man had retained his original dominion and lordship over nature, the case would have been different. If man, in his present state, can change so much for better or for worse, how much greater must have been his power according to his first destiny! Aristotle saw clearly that the "higher order of nature" had been disturbed.[22] The Fathers were often too realistic in their ideas about the "course of nature." By viewing purpose from the vantage-ground of utility, they imagined that wild beasts and poisonous plants were specially created after the Fall.

* "Let a new land be discovered with a peculiar fauna and flora full of scientific "interest, and straightway the European purposely introduces his thistles, his sparrows, "his rabbits, or his goats, and the harmonious balance which has resulted from the "organic interplay of ages is at once destroyed. Downright evil is often the result. "Forests are recklessly felled, and arid, rainless wastes, or dismal, fever-laden swamps "ensue How has not the South of Europe been devastated by the axe! When the "woods are left, their birds are killed, and destructive insect swarms are the con-"sequence." *Nature and Thought* by St. George Mivart, London, 1885, p. 5-6.

22 See Knauer, *Psychologie*, p. 59.

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Nevertheless it is certain that no one can understand the universe and man who ignores the fact of sin, and leaves original sin out of his calculations. But let us waive that point, and grant unconditionally that the curse pronounced on nature does not affect the original state of nature disclosed by Geology. The order of nature, as a whole, cannot be upset even by man's far-reaching and persistent interference. Are then existing physical evils of such a kind as to disprove the wisdom and goodness of the Creator? Is there really no alternative but to shake hands with Gnostics and Manichæans by having recourse to an inexplicable evil principle? Or must we admit with Stuart Mill that the first cause was limited in power, and had to struggle from the outset against an eternal existing matter?

The Creator alone can be absolutely perfect. Relative perfection includes a certain imperfection in its very notion. Metaphysical evil, as Clement of Alexandria rightly observed, is inseparable from things finite. The imperfection, however, is often represented to be greater than it really is. Everything, in its kind, is perfect and proportioned to its end. The gradations in perfection are a proof of orderly thought. The imperfections are an advantage to the whole. The very elements, that are so destructive of man's handiwork, are the scavengers and washerwomen of inorganic nature. Shipwrecking storms and direful thunders, when they pour down refreshing rain, come as a boon and a blessing to fields and crops, to man and beast. It is the excess that does the harm. But their regular action is quite in keeping with a useful or serviceable purpose. Contrary purposes are inextricably bound up with things finite; only in the absolute are all contrarieties swallowed up. In the irrational organic world, too, evils are less than they seem. I am not one of those who set down animal suffering as moonshine, and as existing only in man's imagination. Neither can I agree with those who hold that the pain, though real, is deadened by the want of self-consciousness. To me it seems that the German proverb still holds its own: " Never torment

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an animal in fun, for it feels pain as much as you."* Still, the sensibility of the animal must not be put on the same level as that of self-conscious man. Nor should it be forgotten that sensibility, besides being a necessary element in the world's constitution, is a fruitful source of pleasure as well as of pain, and that it promotes the end of the organism.[23] Sensation, even as pain, by setting spurs to prudence and fear, becomes a helpmate in the struggle for life. The feelings of pleasure and pain produced by agreeable or disagreeable impressions stimulate the animal to obtain things that are useful, and to ward off what is harmful. And if the sensitiveness of animals to pleasure and pain be taken into account, this relation of their organism to the external world will be seen not to be devoid of purpose. Men fight, and animals devour one another. The hurt of one is the good of another. The mouse destroys the nest of the humming-bird, the cat eats the mouse and restores the equilibrium between the bees and the clover. The bird feeds on destructive insects, and itself falls a victim to the bird of prey; the bird of prey, in its turn, is shot by the sportsman. Thus the struggle is mutual, and has an equalizing tendency. It preserves the balance, and thereby does good. But this mutual onslaught is a blessing to many animals, to whom sudden death brings less pain than death by sickness, old age, or starvation. That there are refinements of cruelty in nature no one will doubt who has seen a cat play with a mouse, though the mouse is already stunned by fright. It is said that at the sound of the rattle the victim of the rattlesnake stands motionless. As long as wild beasts take pleasure in eating live food, a sort of cruelty is, so to speak, legalized by nature. But the cruelty seems greater than it really is. As a rule every species instinctively adopts a special mode of killing or stunning its victim, immediately it is captured. The tiger's skill in opening jugular veins is with-

* "Quäle nie ein Thier im Scherz, denn es fühlt wie du den Schmerz."

23 Fischer, *Das Problem des Uebels und die Theodicee*, Mainz, 1883, p. 155. Zacharias, p. 79.

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out a parallel. The bird of prey deals its victim a deadly blow on the head with its beak. The lion makes the sheep unconscious by shaking it well in the air. Livingstone relates how one day a lion seized him, lifted him up from the ground, and shook him like a cur shakes a rag. While in this critical position he was wholly unconscious of his danger, for a refreshing delirium had taken possession of him. Then he completely lost consciousness and, had the lion swallowed him, his death would have been painless. A bullet from a comrade's rifle, however, saved him from this fate.[24]

Teleology is one of the proofs for the existence of God. This proof is called physico-theological because God, who is the centre of faith and theology, is made known in the natural order. It is called teleological, because it reveals the all-wise and all-good Creator in the purpose that is inherent in all things. It is at once the oldest and most convincing proof, because it combines most beautifully the external world of nature with the internal world of mind and spirit. Inner and outer experience, nature and spirit, combine their forces to reveal to man his last and highest end. Between the human mind and outward nature there is a connection, otherwise no human knowledge would be possible. For this reason human knowledge is real and true. The existence of a Creator who has stamped his design on all things is but the logical deduction from the facts of the outer world and the inner consciousness,—a deduction to which the tribunal of science must allow as much validity as to any other necessary consequence of the law of causality. For the validity of the laws of thought is either absolute or nil. The teleological view of the world includes a material and a spiritual element, but it considers both under one aspect—the idea of purpose. Thus the physico-theological proof appeals to man's intellect, and almost strikes a chord of sympathy in his heart. It has a living interest for both heart and mind.

24 *Controverse*, 1884, p. 432.

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The superior wisdom in which the universe is moulded leads his understanding captive; the diversified harmony and matchless beauty of nature wins his heart, while his will is fascinated by the infinite goodness pervading all things. This is the proof on which Aristotle and Plato, Fathers and Schoolmen chiefly loved to dwell.[25] Even Kant treated it with respect. It seems doubtful whether this proof from the mere idea of order and purpose suffices by itself. For it would seem to prove a maker and organiser of the world merely in a platonic sense. This is the drift of the instances generally given in illustration. Aristotle says: "God is to the world what the helmsman is to the ship, the driver to the chariot, the chief singer to a concert, the law to the state, the general to an army."[26] But as Aristotle firmly believed in the eternity of the world, God is, in his eyes, only the unmoved mover towards whom all things move. Hence neither the cosmological nor the physico-teleological argument would have been sufficient to prove to Aristotle the existence of a Creator. But once we start with facts and realities and not merely with ideas, it becomes perfectly plain that there is no sharp dividing line between the two arguments. It is the same as with the actions and attributes of God; neither can be wholly separated from the other. When God works, He is by one and the same act the efficient and the final cause. In like manner the cosmological and the physico-teleological arguments run into each other. The same foundation is common to both. As our study of the origin of the wonderful gradations in nature led us to the conclusion that an absolute, intelligent and personal first cause exists, so also the inner finality in all nature, especially in the human mind and will, points to an intelligent and holy being who created this purposeful world. The most faultlessly perfect heart pales before the inherent, inborn purposeness of nature. God is manifested as the

25 Petavius, *De Deo* I., 1, 5. Moehler, *Athanasius*, I., p. 15, seq. Kuhn, p. 684.
26 Pesch I., 860. See Möhler I., 153 seq. and Cicero, *De natura deorum* 2. Also Petavius I., 1, 6 seq.

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supreme artist, but as the artist who has sown art in things themselves. Finality is not an idea hovering over the universe, like the spirit moving over the waters, but an idea grafted into the nature of things, a real idea wedded to a mechanical cause. So far, indeed, we have proved the existence of an intelligent Creator. But we have gained only an analogous knowledge of His nature. Analogy is but a makeshift that is useful with our defective modes of cognition. From the form which our ideas take we cannot conclude that they must of necessity be predicated of the object itself in that same form.* Thus when, after the manner of men, we ascribe intelligence to the author of this world because he works with order and purpose, we do much more than merely testify to the fact that such is our mode of cognition. We know full well that we are making a leap into another genus, and that we are falling into a sort of anthropomorphism.[27] Nevertheless we are thereby not merely following the necessary laws of thought, but are proceeding the only way in which it is possible to solve the riddle of the universe. Either scepticism is the only true philosophy, or this knowledge of God is true, if not the whole truth. We do not contend that we thoroughly understand the nature of God, but that this knowledge is a necessary stepping-stone to the higher knowledge of God. Hence Philo said : To prove that God exists is easy, but to know what He is, that is almost impossible. The Fathers openly avow the same thing. They lay stress on the imperfect character of our knowledge of God, when combating the errors of the Aëtians who thought that they had found an adequate conception of God in ἀγεννησία. Even the light of grace cannot enable us to know God's nature thoroughly. All our knowledge is piecemeal.

* The author is merely epitomizing the doctrine of *analogical* cognition. The reader will find a fuller explanation in books of logic, and in Franzelin's *De Deo Uno* (Thesis. 10-13). The author means that we must distinguish between the *form* and the *contents* of the idea. What we call "wisdom" is, in form, human and finite (a quality), but the thing so named (*res concepta* not *modus concipiendi*) can also be in God. (Tr.)

27 Kant, l.c. p. 160.

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CHAPTER XI.

VIRTUE AND REWARD.

Within every living being there beats an impulse which prompts it to preserve life and to gratify its wants. The plant-germ, as though aware of the conditions under which it can live, unconsciously and mechanically fixes its tiny roots in the soil and turns its first shoots towards sky and sun. The young plant, as it were, revels in this continued beneficent influence until it can wave its opening capsules in the sunlight, and greedily drink in the many-coloured rays. At night the plant either inclines its flower or closes it up altogether. By a vigorous reaction it protests against any injury done to its organism, and often reproduces the part injured. If light is shut out, it lengthens its stalk in order to carry its leaves to the nearest opening through which light can enter. What *natura naturans* does unconsciously and mechanically, that the animal does consciously, though the consciousness be but instinctive. The instinct of self-preservation is the law that governs all movement in the animal kingdom. The satisfaction of that impulse is regulated by the feeling of pleasure and pain. The animal arms itself against all hostile attacks. Even the worm, when trodden on, curls itself up in the dust. But every animal feels pleasure, whether good food or the gratification of the instinct of propagation be the cause.

There is something of the animal also in man. The instinct of self-preservation is as inborn in him as in the

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animal. Nature has planted the desire of pleasure and enjoyment in his breast. But even thus far man is essentially distinct from the brute. The animal has, indeed, the instinct of self-preservation, but is wholly unconscious of its being and end. It knows nothing of birth, life, and death. But man reflects on his being and existence. He sees death afar off. He knows that his whole life is really a slow death. The fear of death is in direct antagonism to the instinct of self-preservation. How often it saddens and embitters our sweetest joys and casts a dark shadow over the sunniest hours of life. The rich man says to his soul: "Take thy rest, eat, drink, make good cheer. But "God said to him: Thou fool, this night do they require "thy soul of thee; and whose shall those things be which "thou hast provided."* In this, man is worse off than the animal. He knows of death's fell approach, and sees it ahead. He is daily reminded of death, and the thought fills him with a constant fear and trembling. This alone would suffice to make him repute all earthly happiness and pleasure as nothing. Even man in his prime is like the fragrant flower to which the worm is drawing near. Whether he will it or no his fate is always staring him in the face. He knows that he is unhappy, and he is unhappy because he feels and knows his unhappiness. Man, as we saw above, has a larger share of sickness and suffering than the animal—a fact that acquires a new significance because man is fully aware of this circumstance. He is dissatisfied with his lot. The feeling of discontent is ever smouldering in his breast, ready to burst out into a flame. And yet the yearning for happiness can never be uprooted from man's soul. His whole life is a piteous chase after happiness. All men seek happiness, though each one chooses his own route. One places his happiness in war or politics. Another's happiness is at the highest amid science and art. The happiness of a third is seated in virtue or pleasure. All man's efforts have happiness for

* Luke XII., 18.

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their object. Even the suicide hopes to better his lot. By annihilation he seeks to banish want and care and to be rid of hardship and suffering. How few attain the happiness they seek? How many who attain it are allowed to enjoy it without let or hindrance? A confession that many desires are unfulfilled may be read in the eyes of all. Rulers and subjects, generals and soldiers, learned and unlearned, artists and artisans, merchants and labourers, rich and poor, old and young, men and women must acknowledge that happiness is strangled in tears. All must confess that scalding salt tears, brewed in sorrow, have trickled down their cheeks into their cup of pleasure. Nothing in this world can give full, complete and permanent happiness. The Sultan in an Eastern tale was advised that he would be restored to health if he wore the shirt of a happy man. The Sultan's messengers scoured the country but could not find any one, high or low, who would own that he was really happy. At last they found a poor shepherd who said he was happy. But the shepherd could not be prevailed upon to consent to part with his shirt. Then, the messengers tried to take it from him by force; but it turned out that he was not blest with a shirt!

Does man perchance find happiness in his own inner self? Can he despise the outer world, and renounce its possessions? Can he encase himself in the armour of indifference and apathy, and thus steel himself against its allurements? The Stoics thought so. Anyhow their doctrine was better than the hedonic principle of ancient and modern Epicureans, whose *summum bonum* lies in the pleasure denied to the majority of men, and not vouchsafed to the upper classes unmixed with pain. But the Stoics desired the impossible,—an impossible, too, that could not have satisfied man's aspirations. Man has feeling and is a social being.* *Nolens volens*, he is tempted by the outer world, and thus his apathy is endangered. He cannot completely deaden his feelings and remain indifferent to

* Society, saith the text, is the happiness of life.
(*Love's Labour's Lost*, IV., 2.)

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all influences. The enemy, from whom there is no escape, lurks within him in alliance with the outer foe, and surrenders the fortress before the holder becomes aware of the treachery. There is no shirking the struggle of reason against passion, of the superior will against the lower appetites. I do not what I will but what I hate. I do not the good that I will, but the evil that I will not, that I do. Unhappy man who shall deliver me from this body of death? For a time man may delude himself with regard to this inner warfare, and may be the dupe of his own weakness. In the whirl of sensual pleasure and æsthetic enjoyment he may drown the memory of the schism within that is driving him asunder, but the struggle will rage again with redoubled force. Man can labour for the moral improvement of himself and others; he can try to restore the moral order. He can find spiritual delight in the proud and stoical exercise of virtue for its own sake. He can seek his happiness in morality. But experience shows that the strength of unaided man fails, and that his efforts in this direction are merely spasmodic; neither do they beget full contentment. Whatever be the boast of independent morality, it is certain that the average man will make no stand against passion and sensuality, unless his efforts are rewarded by something more than the satisfaction he feels in making the effort. Virtue charms us with the reward that it holds out to our successful efforts. With it God has linked courage, and the hope that an unfading crown will be the prize of victory in a short but severe struggle.[1] Sometimes, indeed, virtue is practised without any view to an eternal reward; but this is an exception to be dealt with in psychology. The sort of virtue, too, would have to be enquired into. Virtue can only be happy in the true good that is never found on earth. The moral man aims not at practising one or other virtue, but at weighing all his actions in the scale of virtue. A moral disposition for its own sake is, indeed, still more remark-

1 See Irenæus in Schwane, *Dogmengeschichte*, vol. i., p. 444, seq.

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able. What a mighty power it is in the heart of man! For it raises man so far above his many wants that he is prepared to sacrifice them, and to adjudge himself unworthy of life if, for the sake of the enjoyment he craves, he were to transgress the law of reason.[a] But, as universal experience teaches, it is incorrect to suppose that reason issues mandates unaccompanied by promises or threats. This delusion is not the outcome of the teaching of the heart, but a philosophical abstraction. The Apostle speaks of the thoughts that accuse and justify, and of the law written on the heart that upholds the judgment passed on works done without the law. Rewards and punishments are held out by the positive law, and also, though not so clearly, by the natural law. Let us even suppose that "this incomprehensible moral disposition, stamped with the mark of a divine origin, might fill man's mind with ecstasy, and nerve it for the sacrifices that the love of duty may require." Still, as a matter of fact, it will work a general and lasting effect on most men only when joined to religion and God and brought into relations with happiness as a reward. The heart will not forego this noble "egotism."*

Virtue is often unrewarded in this life; it is even despised and persecuted. Virtue and earthly prosperity seldom go together. "But my feet," says the Psalmist, "were almost moved, my steps had well-nigh slipt, because I had a zeal on occasion of the wicked, seeing the prosperity of sinners." Moral effort and the inborn tendency to happiness are contrary one to another. If the virtuous man has no hope after death, if he has no worthy end in the next life, then he has no end at all. He is more unhappy than the brute that knows of no end and

[a] Kant, *Religion*, etc., vi., p. 143. Lotze, ii., p. 216, seq., 319, 348, seq. Pfleiderer, *Zur Ehrenrettung des Eudaimonismus*, Tübingen, 1869.

* These remarks of the author are singularly appropriate and happy. "Egotism" is a very current objection, especially in England, against the Christian system. The objection is, however, piteously shallow. God is, indeed, lovable and ought to be loved for His own sake. But we could not love Him, unless He were also our good. Such a love would be a psychological impossibility. (Tr.)

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follows its own impulses. If then there be an end and purpose in the moral law, if man is not chasing a will o' the wisp, his goal must lie beyond the grave. Happiness must be in store for the man who lives up to the moral law according to the lights of his conscience. The created mind can find happiness only in the absolute mind, the finite personal spirit in the absolute spirit. Love, truth and goodness are the exclusive property of a person. Nor can they be possessed in their fulness apart from a personal union with the absolute truth, love and goodness. Man is great because he knows his misery to be that of a being destined for better things. None but deposed kings or princes who are heirs to the throne are unhappy because they are not kings. No one complains of having but one mouth, but all feel it a grievance if they have only one eye.[3] Nothing but the hope of reward in the life to come can satisfy this feeling which vividly recalls man's first destiny, and saves man from despair. The thought of his lowliness gives wings to man's propensity, and sets spurs to his efforts to reach this higher end. The greatness of that end saves him from the degradation of the brute.

Man alone is the repository of virtue and sin. In the rest of nature morality has no place. Sin, though commoner than virtue, is nevertheless an aberration, a fault against order, and an infringement of the rights of others. Shall the manifold wickedness go wholly unpunished that gives the slip to the avenging hand of justice? Shall the life-and-death struggle between sin and virtue be but the outward manifestation of that same power in the soul which ripens evil and breeds iniquity? No. The moral conscience of mankind will never smother the conviction that a supreme judge presides over human actions, to reward the good and punish the wicked. If any universal feeling exists, it is surely that justice will equalize all things. The blood of the just cries for vengeance to the heaven to whom vengeance belongs. The groans of op-

3 Pascal, 23, 3, 4.

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pressed widows and orphans, and the wailings of persecuted innocence rend the clouds and ascend to the throne of the Just One. Unless compensation be assured in the life to come, man's moral conscience rests on the shifting sands. The future life is, to say the least, a postulate of practical reason. But it is incomprehensible and ineffective without that moral disposition and finality which God has instilled in the soul. As a moral system, "Natural Religion" postulates God as the moral originator of the world. It demands also that the duration of man's existence should be in proportion to the whole plan and purpose of creation. Morality, according to Kant, is a purely practical concept of reason, which, though most fruitful, supposes a minimum theoretical power of mind. Hence it can be brought home to anybody and everybody as a practical duty. If this were so, morality would be groundless and inexplicable. That cannot be foreign to the theoretical reason which presses with such force on the practical reason. Our conclusion, therefore, may be justly valued not merely as a postulate but as a necessary consequence of the theoretical reason.

This is known as the *moral* or *anthropological* proof for the existence of God. It is a continuation and a necessary consequence of the physico-theological proof. The question of the purpose and end of morally free beings like man finds its complete and proper answer in the consideration which regards the troubles of earthly life as merely the jarring discords of life, and not as in any way at variance with the Creator's goodness. Thus the condition of man again draws nearer to what it was in the beginning. But man's troubled heart can nowhere find complete rest and peace but in the blissful teaching of Christianity. It is the truth and grace of Christianity that quicken the moral proof with living force.

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CHAPTER XII.

THE SOUL.

In considering organic beings we have repeatedly touched the brink of that great chasm which science vainly strives to span with the law of causation. To experience the origin of life remains a riddle; sensation and animal consciousness are shrouded in darkness; and man's conscience and self-consciousness break the ground of new problems. Hitherto we have been dealing with facts as they stand, and enquiring into their origin and end. But now it is imperative on us, without diving deeply into psychology, to answer the question: What is the proper seat of this organic activity? The effects of a thing are our only clue to its nature. Our very knowledge of God is fettered in the manacles of this all-building law of cognition. God is known to us by His work in nature and His action on the soul, i.e. by analogy. Hence it is truly said that His inmost nature is hidden from our natural view. It is the same with the being of the soul. The soul is, indeed, our own self, our principle of life, thought and action, but we know it only by its actions. Our actions tell us it exists, but we can gather its nature and manner only by analyzing the character of these actions, just as we take a machine to pieces and explain its complex action by analyzing the forces and action of the several parts. We admit, however, that the several parts and forces are given quantities, though we cannot define them closely or explain their joint action. We imagine we have a deep insight into them, because experimental perception and intuition come to

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our aid. But closer observation will convince us that our knowledge of physical events is only skin-deep. Hence we must not be surprised if we flounder, while exploring the soul, and casting plummets to sound the mystery of the mutual co-operation of soul and body. For intuition leaves us in the lurch, and it is difficult to extract a clear idea from the heap of definitions that psychology has given of this unknown force. We can never grasp this wonderful thing in its inmost nature, nor make the reciprocal action of the heterogeneous components transparent.

What is life? We daily encounter life at every turn, and yet we are embarrassed when asked to say what is the secret of life. Attached to external conditions and mechanical appliances, we find a series of activities which cannot originate in either the appliances or the conditions. One thing only is clear: life has its seat within the organism. Organization and vital actions proceed from it as their principle and cause. But what sort of a thing is this principle and inward cause? It might, perhaps, at a stretch, be just possible to explain the phenomena of vegetative plant life by the mechanism of atoms and the informing plastic principle of individualization, although, be it noted, this would also imply a special force of organization. But such a principle (the word is very ambiguous) could not possibly embrace all organic evolution, man included. Organic life, it is true, always begins with the lowest grade, but its principle is one in all forms. The plant never has its balmy slumbers waked with the strife of desires that stimulate self-motion. It is moved solely by mechanical stimulants. It shows no trace of a free determining power, a will animated by a soul. But the spontaneity of animal movement is a sign of sensation; and sensation, even in the lowest animals, is the index of a soul. What is this animal soul? Etymology tells us that its original meaning was life as manifested by breathing. In the simple story of Genesis it is recorded that God breathed into man's nostrils the breath of life. Herein lies the kernel of the question. But Genesis says nothing

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of the souls of animals. It pictures living beings as such, as produced by the elements. The animal soul is so closely bound up with the body, that the two are produced and perish together. It is well known that when some of the lower animals are torn asunder, the several parts live on. From this fact the philosophers of old argued that the soul is divisible, and hence material. The Ionians, Bacon, and others supposed the soul to be a special kind of body. Gnostics and Manichæans also taught that it is material. After much brain-racking Augustine and other Latins at last grasped the notion of things immaterial. Modern science teems with proofs of the soul's divisibility. It has demonstrated that many-celled organisms split up into new individuals, as in the remarkable fresh-water polyp (*Hydra viridis*). It has further shown that each part of a rightly divided cell develops into new cells. Botanists can divide many-grained plant-cells. The one-celled infusoria have lately been successfully multiplied by cross and vertical section.[1] Hence the egg-cell represents many individuals *in potentia*. Each energy unfolded by the cell is attached to a visible substratum. Individual cells can be divided and potentially mutiplied at all times, and not merely when nature is the agent.

But this certainly warrants no materialistic conclusion, if, indeed, it warrant any conclusion whatever as to the material condition of the soul. For since the living cell differs specifically from an inorganic molecule, so the divisible living principle cannot be one with the atoms. The divisions effected prove that the nervous power is diffused throughout the cell. Hence the soul is present in the individual cell as a whole, and has, at the same time, a capacity for existence in the several parts. It is clear, too, that the several parts of the whole soul are pervaded by an organic unity, from the fact that the cells, when artificially divided, revert to one cell, and that two animal organisms, originally separated, coalesce into one.

1 *Natur und Offenb.*, 1885, p. 316, seq. Hertling, *Grenzen*, p. 121. Pesch, *Welträthsel*, vol. I., p. 137. Commer, *System*, vol. II., p. 150. Bastian, vol. I., p. 140.

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For this reason many modern Scholastics follow the older Schoolmen in explaining the animal soul, which was considered *substantia simplex incompleta*, as a material substance.[2] Others incline to regard it as a simple immaterial substance which differs from the human soul in two points only: its knowledge and will are sensible and not rational, and hence it can have no higher end than to animate the animal body during this material life.[3] These writers are enabled to palm this doctrine on the Schoolmen by interpreting their definition of body as a quantitative compound, instead of a compound of two substantial principles, viz., matter and form. In this, as it seems to us, they interpret the Schoolmen wrongly; but that does not concern us here. At any rate the episode shows the difficulty of extracting animal psychic phenomena from matter, even when it is acted on by a higher cause. It seems doubtful whether the scholastic idea is adequately rendered by conceiving the animal soul as a mere *forma substantialis non subsistens*, and as the actuality of the animal.[4] For S. Thomas speaks of the animal soul as derived from the soul of the parent. Thus, in the *annulosa* (which survive fission) there is one soul *in actu* and many *in potentia*. The soul belongs essentially to the entire organism. It is one with the body in activity, and therefore is certainly not an independent substance. As soon as life ceases, it ceases to be an animal. But, is it not the same with man? Can a corpse be called a man? If we must ultimately explain the animal soul as an *actus materiæ* produced by external causes, *i.e.* in the last resort by God as the creator of the typical forms of nature, then we are again confronted by this unknown something. As the *actus materiæ* operates solely on animate matter, matter as such cannot be its substratum. The "resultant of the forces," "the unknown forces of nature" and such-like hollow sounding

2 Pesch, l. c. Hertling, p. 122. Kleutgen, *Philos.* I., p. 42; II., p. 304.

3 Hettinger, *Fundamentaltheologie*, vol. I., p. 62. Dressel, *Stoff*. p. 78. Girodon, *Exposé de la foi*, vol. I., p. 255.

4 Knauer, *Psychologie*, p. 70, 171. Girodon l.c.

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phrases leave us quite in the dark as to the specific nature of the organism. The resultant of the forces is dangling in mid-air if it is not enthroned inside the organism. The forces themselves must be organic if the resultant is the principle of life.

It must be conceded, it seems to me, that the animal soul is propagated by generation, and not produced by creation or any analogous agency. Like the body it is bounded by generation and corruption. In contradistinction to corporeal substances it may be called material, by reason of its essential dependence on matter. In the lower animals life is equally distributed among all the nervous centres; in the higher animals the seat of psychic phenomena is the brain. Between the souls of the two there can be no essential difference. Therefore no other course is open but to regard the animal soul as an *active substance*, implanted in the germs, communicated by generation, and diffused over the gradually evolving organism. It may be compared to the magnet which attracts the whole piece of iron by polarizing its particles. There still remains, however, the essential distinction, that the one force acts by necessity, the other by impulse. Natural force is not a substance, whereas the soul cannot be conceived as anything else. Modern psychology loves to distinguish between what is called a substantial and an actual notion of the soul. The former may be said to include all the theories that conceive psychic facts as emanating from some hypothetical substratum, whether material or immaterial. The latter includes the theories that make the spiritual element consist in pure actuality, or in the immediate manifestation of spiritual life.[5] To this last concept the animal soul can lay no claim. Neither, however, can the first be rejected as unconscious materialism, on the plea that psychology, unlike the physical sciences, requires no metaphysical concept beyond the actual fact of inner perception. For from this it only follows that the substratum

5 Wundt, *Philos. Aufsaetze*, vol. ii., 1885, p. 483 seq.; vol. i., 1883, p. 312.

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must be different in character. "What we call soul is the inner being of the identical unit that we externally regard as the body belonging to it." But this definition takes into account the being of the soul apart from its nature. As the simple principle of life the soul is spread over the whole organism. It is (at least virtually) present everywhere in the cells, and produces a new organism when external circumstances are favourable.

Whatever be the "life-force" of plants and animals, the human soul, at all events, must be conceived as an immaterial simple substance. Its physical origin is unthinkable. Spiritual production, too, is disallowed because spirit is not propagated by generation. By reason man can explore the secret recesses within him. After proving, from the nature of his intellectual and moral life, that the intellect cannot be material, he shows *positively* that it must be immaterial. The soul instils consciousness into sense-perceptions, forms ideas, passes judgments, and controls the body and its desires. The eye can only see, and the ear only hear; but the soul knows what is seen and heard, and passes judgment on the same. A mere sensitive faculty, inasmuch as its capacity is limited to sense-perceptions, can never acquire a knowledge of things simple. Even if the simple could in any way become the object of sense-perception, a sensitive faculty, being itself compound, could not perceive it as simple. The idea of unity, which is the basis of number, is beyond the animal; neither does it ever learn to count. If all sense-perceptions be added together, the total or resultant will yield nothing specifically higher. But man soars high above the realm of sense-perceptions. His thoughts are unconfined by space or time. He treads down extension and divisibility. He glides through solid matter and sensibility. He cuts his way to the truth that lies at the root of all things. Thought resolves the composite, divisible and changeable objects of sense into their simple elements, and resolves these into the unity of the thinking soul. The activity of the reason, as such, is independent of matter. Nay, as a

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rule, it grows in intensity the further it withdraws from matter, and fixes its gaze steadily on what is immaterial. It alone, therefore, can conceive itself as a simple being. The process of thought demands a spiritual and immeasurable unity, a unity gathered up in a point. Amid all the changes of matter the soul remains the same, as is shown by the relations of its activities and conditions to the *ego*, as distinct from its own body and the external world. In contradistinction to the *non-ego* the soul knows that it is a self-subsisting being, and is conscious that it is absolutely and certainly different and distinct from the world. The road to self-consciousness may be long; the external influences at work to further or hinder development may be manifold; but amid all the changes there looms always the same background of personality. It is a debateable point whether the soul undergoes any change during the development of self-consciousness, in its active or passive state. On the one hand such an admission would seem to imperil its spirituality; on the other it would gain in flexibility by removing that unbending rigidity and statuesque immobility which belong to the soul if it remains ever the same. The mind is surely conscious that one and the same *ego* is the subject of consciousness, however changed its state and conditions may be. Its remembrance of its previous states and the provision it makes for its further development prove the unity of the spiritual substance quite as much as they prove the unity of development. From the unchangeableness of the soul's substance the Schoolmen argued that by knowledge it is capable of drinking in all things, not only in their phenomena but also in their essence.[6]

The unity of consciousness, without which our inner states could never become collectively the object of self-observation, compels us to assume a supersensible simple being as the subject and cause of the phenomena.[7] The mere fact that man can pourtray his own self, and become

6 Kleutgen, I., p. 47. 523.
7 Lotze, *Microcosmos*, Vol. I., p. 170 and 256; Vol. II., p. 175, seq.

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the object of his own thoughts, is enough to stamp the soul as supersensible. The unity of consciousness transcends every other earthly unity. For the mind knows how to knit its states into one collective act. It can also unite the manifold impressions of sense into a connected whole, and make them into a picture modelled on its inner unity. It could never picture the universe as one, were it not conscious of its own unity. It knows itself to be the one identical subject of the perceptions imported into it from different times and places. This substantial unity of the soul, however, is not sufficient for its inner activity. By association and reproduction, by winnowing like from unlike, the mind also solders and welds its inner states into unity. Its ideas of space and time fly far away from things of sense. Ideas are not imprisoned in space, nor are recollections blurred by time. But out of them the human soul constructs a world in time and space, and is thus mounted on high above time and space.

The soul, therefore, must be a substance, because the consciousness of all acts centres in the *ego*; and memory shows the unity and identity of the *ego*. In its nature this unity is not logical and abstract, but real and substantial. As the subject, the soul acts independently in itself, and on itself, and on the external world. Every activity has a substantial basis and hence, as ancient philosophers argued, the soul is a substance that lives, feels and perceives, thinks and wills. The idea of substance shows the principle of the activity and stability of its being; the idea of cause shows the principle of life; and the idea of purpose shows the principle of intellectual life. The intellectual life, whose existence is undeniable, is a pure actuality, and consists immediately in the phenomena and manifestations of life. Activity, however, should be distinguished from the substantial subject. And this substance is immaterial and spiritual.

Are we, however, justified in arguing that material things have no unity because they are divisible? or in inferring the immaterial nature of the soul or *ego* from its indivisible

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unity? It may be urged that this is pure "dialectical clap-trap." For, firstly, the theory of the continuity of substances has as good a leg to stand on as the atomistic theory; and secondly, our ideas and concepts require, indeed, an actual and undivided unity, but not a geometrical or metaphysical simplicity.[8] This is true of the inferior life of the soul, but not of its rational activity. The life of reason is the strongest spiritual bulwark against materialism. In so far as the soul is the *entelechia corporis* (actuation of the body), it is one with the body, and forms part of the human species. In itself, therefore, it is not an individual substance, hypostasis, or person, but it is put over the body, and fights against the body. So the higher principle of the intellectual functions must be immaterial. According to Aristotle the *νοῦς* is only divisible in the same way as the eternal is divisible from the temporal. Augustine stigmatized as a self-delusion the opinion that the soul is corporeal. Man has only to turn the mirror of reflection on himself, and he must see that inner psychic phenomena and the nature of the soul can be known only by the intellect, and not by the bodily senses. Hence he must also see that the inner states are not sensible but intelligible objects, and that therefore the nature of the soul delineated in them must be intelligible and not sensible. The images of sense are corporeal, and contained in a framework of space; but these two distinguishing marks are wanting in the internal acts of life. The ideas of truth, beauty and goodness serve to judge the world of sense, though they are not of it. The intellect is above sensible images because it judges and reproduces them.

The difficulty of explaining the *union of soul and body*, and their mutual action on each other, grows in direct proportion to the intensity of the contrast that is set up between the ideas of the material and the immaterial. The whole soul, says St. Augustine, is in the whole body, and is whole and entire in every part thereof. The soul perceives

8 Liebmann, *Anal.* p. 301. Hertling, p. 121, *Materie und Form*, p. 142, seq. Storz, *Aug.* p. 110.

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where it sees, and sees where it perceives, and is where it lives. It is a trite saying that a thing acts only in the place in which it is. In the case of the soul, however, the order is reversed, for the soul is where it acts. Being immaterial it is not chained down to one dungeon. But being one with the body, its action must be dependent on the body, and be greater in one place than another.

All attempts to define the *seat of the soul*, and to specify the link that joins it to the body, have failed. Wherever life is, there is the soul. A thousand living threads interweave it with the organism. The soul acts on the body, and the body on the soul. The mysterious skein of contact is too entangled to be unravelled. Ancient philosophers sought the soul in the blood, the moderns in the brain. Anyhow the nervous system joined to the central organ is the most essential organ of the soul's activity. Some have even tried to point out the precise spot in the brain from which thought might flow in the ordinary process of motion. Hitherto physiology has failed to hit upon the central point in the nervous system. Indeed its success is impossible, if the soul is the animating principle of the whole body, and if self-consciousness pervades the whole *ego* and not merely a part. Descartes thought the seat of the soul lay in the pineal gland. This is now looked upon as a rudimentary organ that in times past fulfilled certain functions. Perhaps it served as a sense of heat.[9] Nor can it be shown that the soul resides in any particular substance of the brain, e.g. phosphorus. For the dependence of thought on this substance, if established, would not even prove a causal relation to subsist between them, let alone an identity. The brain is only the soul's organ, albeit a necessary organ. As the most skilful and accomplished pianist cannot play without a piano, so the soul is powerless to do its functions if the bodily organs are destroyed or deranged.

In man and animals the life of the soul corresponds to

9 Zacharias, *Probleme*, p. 91, seq.—Bastian, vol. i., p. 119, 128.

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the structure of the brain. If the brain is injured, the life of both suffers ; but this is far from establishing identity between soul and brain. Even the virtuoso cannot produce high artistic results on a bad instrument. The development of the brain keeps pace with the development of intelligence. Physical formation and spiritual activity run on parallel lines. The vital barometer rises or falls with the bodily temperature, as may be seen in different individuals, and also in the same individual at different ages. Still difference of brain will not always account for the different degrees of intelligence in different individuals, or even in the same individual at different ages. Sometimes the mind comes to maturity in childhood. Old men are often sharp-witted. Many men, distinguished in art and science, have enjoyed vigorous health in mind and body till a ripe old age. Some, owing to a defect in the bodily organism, never arrive at actual self-consciousness ; others lose it through an injury done to the brain. But the power of self-consciousness exists in both, and becomes actual as soon as the obstacle is removed. If certain definite parts and convolutions of the brain correspond to certain spiritual faculties, this only shows that there is a general dependence between the two. The perceptive centres of the two cerebral hemispheres stand in the closest connection with the imagination : but fierce opposition awaits any attempt to localize spiritual acts on the lines of Dr. Gall's phrenology.[10] No one, if we may again use the musical instrument as an illustration, imagines that the strings play a tune of themselves, although they sound each and every note when a musician strikes them. It is now known that the eye and ear nerves are each susceptible to a distinct colour and sound, although they neither see nor hear unless stimulated by the soul. As, generally speaking, the consciousness of nerve-impressions is an intensive act, it cannot be occasioned by mere local impres-

10 Schaaffhausen, *Anthrop. Aufs.*, p. 480. Commer, vol. ii., p. 156. See *Les localisations cerebrales. Annales de Phil. chrét.*, Paris, 1886, p. 326. Lotze, I., p. 347, 354. Bastian, vol. ii., p. 198, 293, seq.

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sions. In every act, besides nervous irritation, there must be some other characteristic determinant exclusively corresponding to the exact spot on the surface of the organ of sense, that is irritated by the external stimulant. Hence, were a different point touched, the determinant would also be different.

There is nothing absurd or opposed to true mental philosophy in speaking of the *organs* of the soul, except the phrase be understood in a gross Cartesian sense. It is as foolish to identify artist and machine as to look for the artist inside the machine. On one point, indeed, Materialism is vigorously outspoken. The brain, it says, is the agent, and thoughts, perceptions and feelings are its acts. "This simple relation," says Lotze, "we understand;" but this does not throw the least light on the intellectual and spiritual process. The converse theory that the soul feels, thinks and wills through the brain is not so simple, but it accords better with the distinction between matter and spirit. Vicarious action is possible between the different parts of the brain. One can do duty for the other. When an apoplectic stroke paralyzes the left side of the brain, and thus deprives the body of speech and movement, it not infrequently happens that the evil is in part remedied by these functions being gradually transferred to the other cerebral hemisphere. But self-consciousness is not dovetailed into the several parts of the brain in this way, for it is lost if any one part is injured. Hence it is above the parts. That peculiar mental phenomenon known as the "fixed idea" might seem to be an instance to the contrary. It is to be noticed, however, that it is either something abnormal, or a disease in the process of thought, or a canker gnawing the activity of the will. A continued series of defective perceptions in the same direction may give rise to a similar series of false judgments, which finally handicap the mind in forming a right judgment in this direction; whereas the action of the consciousness is normal in every other direction. Hence a fixed idea is sometimes cured by a startling effect of an opposite ten-

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dency. Or, again, it may be caused by the perceptions, memory or the like, being defectively reproduced, owing to a flaw in the brain. But consciousness may also be considerably influenced by passion and the abuse of the will. Certain fixed ideas (e.g. ambition, the thirst for glory, dipsomania, &c.) may thus arise in the same way as diseased conditions of the brain, and as the spiritual and moral condition generally sinks lower and lower to a semi-animal level.

Griesinger's theory that all diseases of the soul are simply brain diseases is not yet proved with any certainty. A diseased soul may, of course, make the brain diseased. Madness and mental disease, like other properties of the soul, are often hereditary. This is particularly the case with spiritual qualities that depend so much on the organization of the brain, that they almost lead one to suppose every action to be determined by psychic connections.[11] The judgment passed on the suicide is toned down if dissection shows the brain to be diseased or abnormally developed. But even heredity and close connection are not without exception. Children, whether sickly or healthy, are not in every respect intellectually like their parents. Here the rule is honoured more in the breach than in the observance. The organization of the brain is silent on this point. There is, indeed, a constant interplay between the mind and the organ of thought, but we cannot in any one case draw a certain conclusion as to their identity. Men whose minds are diseased, or who have been stunned, not infrequently recover consciousness before death. Then periods of life long past often come back to memory.

These remarks derive confirmation from *dreams*, which are often described as the increased activity of the soul during sleep. They rather indicate a decrease in that activity. The intelligence slumbers, and the vegetative activity is up and doing. Sleep freshens the psychic forces generally, and the brain in particular. For this reason

11 Herbert Spencer. See *Controverse* 1882, p. 747. See also S. Thomas, *Summa Theologica*, 1, 2, qu. 51, a. 1.

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dreaming is largely dependent on such external circumstances as food, digestion, posture of body, the bodily or spiritual exercises gone through during the day, and so on. Special kinds of sickness often give rise to definite and distinct dreams. So there is no need to thrust altogether aside the notion that a sick man may learn the true nature of his illness in a dream. The delusion in dreams is due to the fact that the imagination continues at work during sleep. It resembles true perception in its effects, and it strives to excite a corresponding activity in the mind. But as thought is suspended, and the judgment fettered during sleep, the result does not tally with the perception. In a dream unpleasant occurrences take place; the dangers that seem to environ us are wonderfully vivid and realistic. But, as they are powerless to set the soul in motion, the danger seems inevitable and resistance hopeless. Hence we become so affrighted that we wake. Then, once the consciousness is set free, we recognize that we have been labouring under a delusion. But this very consciousness that we have been deceived by our dreams proves that during sleep the consciousness slumbers. For the wires that connect it with the outer world are cut, and the brain's activity (which is not a mere function of the brain) is diminished, though not destroyed. The soul survives the temporary suspension of its wonted activity, which it afterwards resumes. On awaking, the soul becomes, as a rule, vividly conscious of the thoughts that occupied it before sleep. Here also space and time are annihilated.

The *freedom of the will* furnishes still stronger evidence than the intelligence in favour of the immateriality and spirituality of the soul. For it shows that the body is dependent on the soul, as well as the soul on the body. As the unity of the consciousness proves that the soul is one and simple and not a compound, so free-will arrays it in conscious opposition to all that is mechanical and material. Even the intelligence is governed by the will. An unfeeling act of intelligence can never stir the will. Mental representations and the feelings connected therewith are the

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engines that set the will in motion. It is chiefly the quality and strength of the feeling that determines the will.[12] But we have already seen that the conscious act is also determined by the will. The science of moral statistics boasts of having discovered a natural law that regulates moral actions. Thus it hopes to prove the statement of Celsus that evil is always a fixed quantity.[13] Origen, in reply to Celsus, urged, on the contrary, that an increase in vice was undeniable. Still it may be granted that vice is, to a certain extent, a regular and stable quantity, and that it fluctuates only within certain limits; but a great deal of good and evil is beyond the ken of statistics. Statistics come too late into the field to turn the flanks of indeterminism by proving the absolute regularity of human actions. The will is neither absolutely free nor absolutely powerful. It depends on the immanent laws of mind. It has its limitations like every other creature. It may be inclined to good or to evil, but it is *determined* by neither. Some sort of regularity is quite compatible with freedom. It only shows that the law of an intelligent lawgiver can preserve its regularity, without destroying individual freedom, even in the phenomena that are most swayed by chance or caprice. Man can override his better judgment with the principle, *stat pro ratione voluntas;* but he can also heroically do battle with his natural inclinations. He is free to take independent action even against his own nature; his freedom is unshackled by necessity; he exercises dominion over his own body—all these can only be the acts of an immaterial spiritual substance, that is, of a soul. The will could not be free unless it were seated in an immaterial principle having activity within itself. Liebmann defines free-will as "the consciousness made possible

12 Wundt, vol. i., p. 337, seq. Lotze, vol. i., p. 286, seq.

13 Origenes, *c Celsum*, 4, 633. Gutberlet, in *Natur u. Offenb.* 1886, pp. 1-97, 641, seq. On the other side, Quetelet, *Physique Sociale;* Drobisch, *Die Moralstatistik und die menschliche Willensfreiheit*, Leipzig, 1867—Rümelin, *Reden und Aufsätze*, 1875, p. 1, 370, seq.—Lange, *Geschichte des Materialismus.* 2nd Edit. vol. ii., p. 401. Liebmann, *Anal.* p. 600, seq. *Gedanken und Thatsachen*, p. 6, seq. See also Pressensé. p. 284, seq.

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"by the stable identity of the *ego*, and brought home to "us by the sense of moral responsibility,—the consciousness that man under precisely similar circumstances and "under the action of precisely similar motives (*i.e.* at different times of life) can both will and act differently, "and is not compelled to will and act in the same way."[14] This definition leaves both the fact and the principle of freedom unexplained. The identity of the *ego* and the sense of responsibility can evoke this consciousness only in the supposition that they themselves are immaterial. Dualism (*i.e.* matter and spirit) follows from the recognition of freedom, as surely as its denial is the outcome of mechanical monism. The greater the thought we bestow on moral consciousness, both in its dependence, in its freedom, in its dominion over the material world; the more closely we watch it in its secret workshop of mind and heart; the stronger will grow our conviction that a stone-blind whirlpool of events, in which freedom is swallowed up in necessity, cannot represent the sum total of all realities.

The freedom of the will tells quite as much against the materialist who holds the soul to be a mere *force*, as against the materialist who regards it as matter. Many natural philosophers have conceived a prejudice against "vital force" on account of its analogy with natural forces. For they are puzzled how to reconcile with the law of the conservation of energy this mysterious something which produces novel effects outside the natural chain of causation. But the vital force is hardly touched by the objection, inasmuch as it always acts in conjunction with the forces of nature. The objection, however, applies with far more force to the will. For the will has no resemblance whatever with natural forces and their effects, although it is governed by an ideal and regular law, and gives effect to its decisions through the bodily organs. All natural force is necessary and unchangeable, and acts in one definite

14 Liebmann, *Anal.* p. 601.

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direction ; under similar circumstances it constantly produces the same effects ; it is enclosed within definite barriers by space and time ; nowhere can it be recognised as a whole or as an individual. It is a mere name for an unknown property of matter that manifests itself in a certain kind of movement. In its nature and operation it is indefinable, although it may be defined quantitatively according to the laws of mechanics. Now free-will can neither be weighed nor measured. Though not wholly arbitrary it baffles all human calculation. With wings swifter than thought it can fly across the ocean of things sensible and material. It is, therefore, a force only in the sense in which the one soul has many powers, *e.g.*, feeling, imagination, memory, thought.

All these do but represent the many-sided activity of one and the same immaterial spiritual substance. They should, however, be judged solely according to their spiritual character, not by analogy with the forces of nature. Human thought and will are indeed subject to laws, but laws of the spirit not of nature, laws of freedom not of necessity Like laws of nature they are unlimited in duration. But, being laws of liberty, they allow change amid regularity, and diversity in the midst of stability ; there is, too, an ebb and a flow in the tide of the life of the individual and of society. This truth is taught by Alexander Hales, when he represents the soul as simple, but with different powers, to correspond to the four elements of which the body is composed. The parallelism between the material body and the immaterial soul, though naïve, is well expressed.[15] Nay, empirical laws themselves cry aloud in our favour. For no empiricism has succeeded in tracing to a physical cause the evident facts of intellectual and moral agency. Therefore to deny the immateriality of the soul is to impugn the simplicity, harmony, causality, and conservation of force.[16] Not that the soul itself creates

15 Pfeifer, *Die Controverse über das Beharren der Elemente in den Verbindungen von Aristoteles bis zur Gegenwart*, Dillingen, 1879, p. 15.

16 On the influence of faith and atheism upon modern physical science, see *Controverse*, 1883, May, in connection with *La physique moderne*, Paris, 1883.

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force and energy ; but it imparts an impulse to the application of the forces that lie in a direction different from its own. But in the physical world of causality only like acts upon like. Hence, however firmly the soul is cemented to the body, and however real its action upon matter, it is not a physical or material force. It does not decay and perish like matter, for it is immortal.

Belief in the *immortality* of the soul, like religion generally, has been the common property of mankind in all places and times. No religion is possible without it. Without belief in personal immortality religion is like an arch resting on one support, or a bridge that runs into a precipice.[17] Hope in a future and better life is the priceless pledge that belief in God gives to man. This hope, this belief in immortality, is not wholly wanting even among tribes that stand lowest in the religious scale. A human spirit, that is other than the body and survives after death, is confessed, in one form or another, by the people of all lands.[18] Even the men of the Stone Age, the companions of the cave-bear, who are usually supposed to have devoted all their attention to this life, manifest in their care for the dead their innate yearning for immortality. "Here," says Quinet, "I think I have hit on the corner-"stone on which things, divine and human, are built. From "this beginning all the rest easily follows." The importance of the historical proof cannot therefore be gainsaid. Cicero says that, in studying the doctrine of immortality, the most ancient authors were the best to consult ; for, he said, the more closely their lives bordered on the first beginning and divine origin of things, the more likely they would be to get at the truth. He found that all the peoples of the ancient world were unanimous in proclaiming their belief in immortality ; and the practical expression

17 Max Müller Essays, I., p. 46.

18 Peschel, *Völkerkunde*, p. 270, seq. Knabenbauer, *Das Zeugniss des Menschengeschlechts für die Unsterbl. der Seele*, Freiburg, 1878. Max Müller l.c. and Vol. II., p. 246. Lotze, II., p. 456. Nadaillac (and Quinet), p. 408. Cicero, *Tuscul.*, I., 12, 26. Cyril Alexandr., *Ep. I. ad mon. orient*. T. X., p. 17. Möhler, *Athan.*, I., p. 150.

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of their faith was their hope in a future reward, and their dread of future punishment. Cicero sees a proof of this faith in the custom of funeral rites. This belief seemed so self-evident to the ancients that they thought it impossible for any one to be in earnest in denying it. Thus S. Cyril of Alexandria asks: "Does any man, who has not eaten "of the root that takes the reason prisoner, hold that the "soul perishes with the body? I don't think any one has "so broken down the pales and forts of reason." S. Athanasius, indeed, thought that by sin souls were made like unto the body, and ruined themselves by losing the knowledge of God. But, in giving the complete proof that God is distinct from the world, he tries to show that the soul is distinct from the body. Consequently he sets out with the clear conviction that the two are distinct. He thought that idolaters did not confess a reasonable soul, because they worshipped soulless idols. The denial of a rational soul seemed to him the logical conclusion of denying the true God, as the soul's consciousness of God would otherwise necessarily lead to God.

The historical proof has met with two classes of assailants: those who challenge the alleged universality, and those who contend that universality is no proof of validity. The arguments already advanced against atheism apply here also; for to deny God and to deny immortality are correlatives. Both rest on the same foundation, and are buoyed up on the same motives. Belief in immortality is wedded to the consciousness of certain duties, against which the sensual man rebels. By passion the human will is easily turned aside from its course, and then it in turn influences the understanding. Thus the belief in immortality, as Socrates pointed out, hangs tottering in the balance of moral consciousness. Socrates was the first to put philosophy on a practical basis. Perhaps he is the only one of the ancient philosophers who gave clear and beautiful utterance to the belief in immortality. All the others, as Cicero says, though lapped in proofs, wavered. Even Aristotle is doubtful. The Fathers, with one concerted

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voice, impeach him for denying the soul's immortality.[19] The νοῦς continuing to exist in itself will always be an enigma. Moral consciousness is the chief prop that sustains the belief in immortality among men. As long as conscience lasts this belief cannot be uprooted generally and for ever. Multitudes may be made practical pessimists by passion, poverty and corruption ; but the universal moral consciousness will cause a reaction. The Buddhists, a religious community numbering several hundred million souls, preach atheism and declare against belief in immortality ; but it is more than questionable whether the people believe in total annihilation, in the Nirvana preached by the philosophers. It is utterly impossible for four hundred millions of men to embrace such a pessimism. But, in point of fact, Buddha's nihilism welled forth from later sources. Buddha's sacrifices and the self-denial of his disciples are barely conceivable without the thought of continued existence. The people pictured Nirvana as a Mohammedan paradise—no poverty, and a continuous round of perfect sensual enjoyment.[20] In this, as in all religious questions, there is a sharp antagonism between the speculations of doctrinaires and the belief of the common people, which tells in favour of natural religion and primitive revelation. Belief always goes before speculation, and is independent of it ; nor does the moral side of religion, as a rule, gain by one-sided speculation.

It may be urged that the doctrine of immortality is not clearly set forth in the Old Testament. Earthly rewards and prosperity, temporal inheritance in the promised land, the outward dominion of Israel are said to be the only inducements that God holds out to those who keep His law. The recoil with horror from death, which seems the destruction of life—a shadowy existence in Scheol—seems but to intensify the gloom that shrouds man's fate after death. Voltaire and his disciples, Deists, and Rationalists

19 Werner, *Geschichte*, &c., vol. i., p. 459, seq. ; v., p. 38. Mach., *Die Nothwendigkeit der Offenbarung Gottes*, Mainz, 1883, p. 68 and 89.

20 Max Müller, *Essays*, vol. i., p. 212, 289. Schell, *Philos. Jahrbuch*, 1886, p. 7, 12.

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from Kant to Schopenhauer, stoutly maintain that the Hebrews did not believe in the immortality of the soul. Twice has this subject been recently debated in the French Academy,—Derenburg and Renan taking the negative, and Halévy the affirmative side. Halévy appealed to the invocations of the dead, and to the valley of the sons of Hinnom (Gehenna). Rabbins and Christians have localized hell in this latter, because it served as a passage to the lower world. But we need not hesitate to cross the Rubicon. These temporal promises have a double aspect: one looks to earth, the other to heaven. By earthly rewards the earthly-minded man was both won over to the law of God, and directed to raise his thoughts above the things of earth. Behind the letter that killeth stands the spirit that quickeneth. The spiritual sense lay in the background of the earthly sense. This truth was the hammer with which the prophets closed up the rivets when the people grew lax. In the Messianic prophecies they paint in vivid colours the glories of the kingdom of the Messias, but they are mindful to demand a new spirit and a new heart. These clear passages are the key to ascertain the figurative expressions current among the Semitic race. Thus even the promise of earthly rewards can be understood aright only when viewed through the spectroscope of belief in immortality. The Jew hoped for things visible. This hope supplied a tangible basis to his thought, which with difficulty flew an eagle's flight, and gazed steadfastly on the supernatural sun. Then, too, God's mercy and justice, when clad in earthly hopes, assumed a pleasing shape. The Psalmist's reflections on the prosperity of the wicked point to a future compensation, that is, to life after death. The patriarchs hoped to be gathered to their fathers, and to find rest and joy in Jehova; and this hope formed the luminous centre of the Israelite's faith. The body will return to the earth whence it was, and the soul to God who gave it.* Without this ineffaceable belief in

* Eccles. xii., 7.

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immortality the Old Testament in its entirety is incomprehensible.

The Comparative Science of Religion, too, extends a helping hand to this belief. It is certain that the Semitic Phœnicians and Assyrians believed in the soul's immortality. The Egyptians manifested their belief in works that to this day excite our wonder. The dread of death and dark forebodings of a lot cast among the shades, are easily understood in an age that looked to the future for light and grace.[21] The abode of departed souls in Hades does not convey a complete notion of immortality, but it discloses a belief in the soul's existence after death. The faith of the Jews in our Lord's time may be gathered from the parable of Dives and Lazarus, and from the discussion about the resurrection. The doctrine of the New Testament and of the Church is as clear as crystal. "Fear not "them that kill the body, but cannot kill the soul; rather "fear him who can destroy both body and soul in hell."—Matth. x., 28. These words of our Lord are the wellspring from which the early Christians drank their heroic courage and contempt of death. Some fathers, indeed, explain immortality in a fantastic fashion, but all keep a firm grip on the doctrine itself; even Tertullian, Melito, Lactantius and others who followed the Stoics in thinking that the soul is in a manner corporeal. Justin derives immortality, not from the soul's simplicity, but from its potentiality to an eternal existence—a potentiality made actual by a special influx of the providential grace of God. Similar theories were advanced by Theophilus, Arnobius, and others; but the faith in immortality was not shaken by philosophic scepticism.

This universal belief in immortality cannot be an error or a delusion. Who shall count the paths of error, or the aberrations of the human heart? Who, on the other hand, shall find an error so universal, and so fraught with con-

21 *Controverse*, 1883, April, p. 390, seq. Kleutgen, *Theologie*, III., p. 920. Scholz, *Theologie des Alten Bundes*, II., p. 79. Knabenbauer, p. 162. Riehm, *Handwörterbuch des bibl. Alterth.*, 1884, p. 628. Schenkel, *Bibellexicon*, II., p. 566, seq.

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sequences to the destinies of mankind? Belief in the Ptolemaic system, it will be retorted, was not less general, and yet it is proved to have been an error. Exception, we reply, may be taken to the universal belief in the Ptolemaic system, for scientific astronomers knew that it was only a plausible theory, not an established truth. With this subject, however, we shall deal later on. For the present it will suffice to ask the counter-question: How comes it that mankind have rejected the Ptolemaic System and not immortality, if one be as erroneous as the other? But there is really no parallelism between the two cases. All appearances told in favour of the geocentric system, but against immortality. Birth and death are everywhere the order of the day. In all things there is a constant ebb and flow. Corruption devours even our own bodies. It is like hoping against hope to believe that we still live after we seemingly die. Appearances jeer and flout this belief in the teeth. But nothing can tear it from the hearts of educated or uneducated, the civilized man or the savage. To call such a belief a chimera is to despair of humanity.

Natural causes are alleged to be an all-sufficient explanation of the belief in immortality, as they were of the origin of religion. It was thought that the facts and phenomena of dream-land supplied the golden key to unlock this wonderful psychological problem. Cicero seems inclined to adopt this theory. Modern ethnographers and psychologists have repeatedly favoured its pretensions.[22] By what magical skill, we may reasonably ask, could the human mind be led captive by dreams which, on awaking, it recognises to have become delusions? How could such a delusion become universal, unless the human soul were predisposed to receive it? The contrary theory, to say the least, is quite as reasonable. Such a delusion could not possibly have found a home in man, had not the belief and yearning for an immortal life beyond the grave been inborn

22 *Tuscul.*, I., 13, 29. Peschel, p. 273. On the other side Schneider, *Geisterglaube*, 2nd Edit. 1885, p. 23, seq. Möhler, *Athanasius*, II., p. 150. Knauer, *Psychologie*, p. 280.

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in his soul. As the soul's power in a dream of cutting itself adrift from space and time is proof of its spirituality, so its remembrance of and intercourse with the dead in dreams is not the origin of the belief in immortality, but the expression of a belief already in existence. A mortal soul could not, when dreaming, grasp the thought of immortality any more than a mortal, perishable body.

Does not the spiritual intercourse with the unseen world authorize us to conclude that the dead can appear and have actually appeared to the living? Such a fact, if well authenticated, would be a crushing argument in favour of the immortality of the soul. The belief in such possible and actual appearances is almost as old as the belief in immortality itself. The sensual man is ever seeking a tangible proof for his belief. To this morbid craving modern spiritualism owes the millions of adherents it has recruited from among men who have lost all real faith. It imagines that its *media*, like exorcists, can call the spirits of the dead from the vasty deep. There are not wanting honest-minded men who are firmly persuaded that spiritualism is a positive proof of immortality.[23] We, certainly, have no wish to condemn spiritualism root and branch, and to resolve it into an airy nothing. Men of science, indeed, go bail for the genuineness of its manifestations. But the unmasking of different *media*, the mysterious arrangements for holding dark sessions, and the silly trifling answers given by the spirits when questioned, engender doubt and distrust. These phenomena have an affinity with the wonders of magnetism, clairvoyance, hypnotism, and the like, which men have come to regard as a higher mode of the soul's existence. Proof, however, has been forthcoming that their phenomena are in part morbid, and in part deceitful and tricky. We can, therefore, hardly be expected to set great store on them as positive proofs of the soul's immortality. In saying so much, however, we in no way intend to give judgment against the possi-

23 *Controverse*, 1885, January and June.

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bility of such manifestations. One thing at all events is clear: living men cannot have it in their power to make the spirits actually appear. If they appear at all it must be in order to minister to the higher ends of God's providence, and not merely to gratify a morbid curiosity. As a rule, too, God employs ordinary means to carry out His designs. As Abraham said to the rich glutton: "They "have Moses and the prophets; let them hear them. For "if they will not hearken to Moses and the prophets, "neither will they believe if one rise from the dead."

An empirical proof is even less feasible. For empiricism is barricaded on every side by motion and mechanism. It cannot grasp the spiritual and moral life. Experience is deaf and dumb to all appeals either against or in behalf of immortality. Empirical psychology may explain the facts to a certain extent, but not in their entirety without overstepping its bounds. Some have thought that the atomism of the macrocosmos is fairly analogous to the monadic hypothesis of the microcosmos. But the *petitio principii* is too glaring to be hid. No bridge can span the wide gulf that divides matter from spirit. Spirituality lies outside the sphere of empiricism; but an hypothesis has been started to make clear the connection between spiritual life and corporeal phenomena. Empirical psychology deals with the world of sense and with the spiritual life as manifested within the world of sense. But the monadic theory puts the soul on a level with material agents. Its indestructibility is, indeed, safeguarded by conceiving it as a material atom. Thus its real nature is sacrificed to save its eternity. Eternal life, according to Herbart, is "an idea floating with infinite softness, an infinitely weak vestige of what we call life."[24]

Hence metaphysics alone can furnish a scientific proof of the immortality of the soul. Only those who allow no force to metaphysics can argue with Scotus that the soul's immortality is unproveable.[25] As the chief arguments

24 See Wundt, vol. i., p. 375, seq. Erles, *Der Unsterblichkeitsglaube*, Karlsruhe, 1885.
25 Stöckl, *Geschichte der Philos.*, ii., p. 843. Schwane, *Dogmengeschichte*, vol. iii., p. 77.

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were drawn out in the discussion on the soul's nature, they need now only be applied. Later philosophers have generally followed Plato, who was the first to rivet attention on the subject. Thus Cicero urges four reasons from Plato : (1) the nature and force of the soul as a self-moving principle ; (2) the pre-existence of souls, as shown in memory, demands as its corollary a continued existence after death ; (3) the other forces of the soul ; (4) the simplicity of its nature. And he holds that philosophy, by thus strengthening belief in immortality, teaches man how to die. The Neo-platonists combated Aristotelians and Stoics ; but they in turn shattered the dual principle by their doctrine that all things emanate from God. Hence the Christian Fathers, in spite of their predilection for Plato, viewed with misgiving the indefinite relation in which he placed the soul toward God, and rejected the emanationism of the Neo-platonists. They adopted Plato's reasons in substance, but supplemented them with other and better reasons drawn from Christianity. The ideas of goodness, beauty, truth and eternity, they say, could spring up nowhere but in an immortal soul. The body is brought into subjection by the mind and the will, and this dominion, they point out, necessarily supposes that body and soul are contrary one to another. In its thoughts the soul rises above space and time. Thought travels more swiftly than the electric spark to the utmost bounds of space ; it joins the present with the past and future, and wings its flight into regions beyond the present. The soul often lives in the body as though it were absent ; it peers beyond the earth, holds intercourse with angels and saints, and, when pure and unclogged by earthly slime, flies up to heaven. It is surely natural that the soul should have a clearer vision of immortality, when its eyes are no longer dimmed by the black veil of the body. For if it can be like an angel when locked in the embraces of the body, its life, when severed from the body, will be more completely absorbed in God who made it through His Logos, Jesus Christ. In Him its thoughts and feelings

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are immortal and eternal, because He is immortal. Thus prettily Möhler sums up the argument of that profound apologist, S. Athanasius.[26] From the several thoughts contained in former paragraphs on God and man, a proof of personal immortality may be easily constructed.

The teaching of Christianity regarding man's original destiny and the origin of evil have brought out in bold relief the antagonism between God and the world, between the soul's present condition and last end. If man is destined to enjoy the vision of God, the soul must, of necessity, be immortal, and the heir to eternal life. This continued existence must likewise be personal, because of the personality of God and man. The Schoolmen, who did not follow Scotus in denying the possibility of proving the soul's immortality, based their proof chiefly on metaphysics and the Aristotelian theory of cognition. Intellectual activity, say the Schoolmen, proves the soul to be immaterial, and therefore indestructible and immortal. The soul is a simple and imperishable form. The scholastic philosophy, however, created special difficulties for those who followed S. Thomas in admitting matter to be the individualizing principle. From this it would seem to follow that without the body there is only one soul, or that all souls are alike; either they form one spiritual substance, or they are as undistinguishable from one another as so many drops of water. But, even apart from this, the continued existence of the soul is made hard to understand by the doctrine that body and soul are united as matter and form. Body and soul are part substances of one and the same being. Form cannot exist without matter. Knowledge is dependent on sense-perception. Without *phantasmata* no memory is possible. Alexander Hales was so impressed by these facts that he admitted the soul to be a compound of matter and form. The form of the soul, S. Thomas explains, is not dependent on the body, but created by God. Such spiritual influences as dreams and

26 Möhler, *Athanasius*, i., p. 151. Kleutgen, *Philos.*, i., p. 722.

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ecstasy supply a higher class of thought than sense-perceptions. Acts of knowledge and will (*intelligere et velle*) are also proper to the soul alone, but memory not wholly so. In this the New Scholastics re-echo his teaching.[27] The following is given as the pith of the Aristotelian doctrine: "In part the soul animates matter, and in part itself "is alive, and the subject of the functions of life. When "the body perishes, the soul perishes with it in part only, "and is replaced by other forms. The part not tied to "matter is not affected by the death of the body but, as "an incomplete substance, will continue to live by itself "for ever." Death is not a release for the soul in a platonic sense, but a rending asunder of parts made for each other. Another difficulty, connected with the former, beset the path of the Schoolmen, viz., their conception of a compound. For the elements while forming the compound were supposed to undergo a substantial change. Hence we cannot, as it has been the fashion since the days of Descartes, deduce the soul's immortality from the notion of the simple or non-compound, for in that case the elements also must be unchangeable.[28] In our own day this consequence holds good both logically and physically. Modern science, in opposition to ancient teaching, not only assumes but demonstrates from Physics and Chemistry that the unchangeableness of the elements must be regarded as an axiom of science. If, therefore, the elements, as at present known, are simple substances, the physical simplicity of the soul will not amount to a proof of its immateriality. Nevertheless we are quite justified in inferring therefrom the *continuation* of the soul's existence, especially if its existence is certain from other arguments. We have as much right to argue that the soul is immortal because it is simple, as modern science has to maintain that the elements are eternal. Augustine agreed with Plato in thinking the soul simple; but, in comparison with

27 S. Thomas, I., qu., 87, a, 8; qu., 89, a, 1. *De Anima*, a, 15, 19, 20. See Knauer, p 267, 259. Schwane III., p. 348.

28 Kleutgen, *Philos.*, II., p. 562, seq.

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the booy, he conceived its simplicity as relative only.[29] The soul is indeed a living unit, but its substance is distinct from the accidents. Metaphysical composition is not excluded. The Council of Vienna in 1311 defined the soul to be *forma corporis* in the scholastic sense. Inasmuch as it is a special form created by God, it must be conceived as a substance; but its relations with the body make it a part substance of man. Its union with the body notwithstanding, it is in itself a spirit, incorporeal and simple. By its very essence this spirit is the form and substance; but a being which is nothing but form must be self-subsisting, and, according to Aristotelian principles, annihilation alone can stamp it out of existence.

The soul's spirituality, therefore, as explained just now, is the chief ground of personal immortality. The mind is, in a sense, illimitable; it is ever in quest of the spiritual and the divine, and of higher knowledge. Spiritual and moral progress and an undying struggle for perfection are incompatible with a being that bears in its bosom the germs of dissolution and death. The soul may indeed be checked in its pursuit after perfection; it may lag behind or turn back. But it cannot disown its inward tendencies, or die out like a flame that lacks oil. The body is not food for the soul, but merely supplies it with matter for spiritual activity; and spiritual activity has its own laws even after the body has crumbled into dust. Here also we may apply what was said, in the moral proof for the existence of God, about the soul's yearning for truth and bliss. This unextinguishable yearning, which never reaches maturity and cannot be wholly satisfied here below, is practically the strongest argument for personal immortality. Kopila, an Indian philosopher, when writing against Buddha who contended that the unhappy man's bliss lay in annihilation, says: "Man wishes to be free from suffering for his "own sake, just as he desires his share of happiness even "in this life. In order to satisfy the cravings of the human

29 Petavius, *De Incarn.*, 4, 13, 9, seq. Schwane, I., p. 79; II., p. 229. Storz, p. 118.

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"heart the soul must continue to exist. If you dispute the "existence of the soul you may not speak of the highest "end of man."[30] The soul's desire to exist for ever was brought forward by the Schoolmen also as at least a secondary proof of immortality. Alexander Hales, Bonaventura and others were debarred by their view of the soul's composition of matter and form, from appealing to its simplicity and immateriality; but they attached all the more weight to the proof from man's last end. The eternal possession of the *summum bonum* alone gives rest and happiness to the human soul. This psycho-teleological proof lies at the root of all proofs of immortality. Faith in immortality everywhere springs from truth and happiness, from the slacking of the mind's thirst for truth, from satisfying the heart in its yearning for sorrowless bliss. Without this belief the longing for perfect truth and virtue would be a delusion, conscience a monster, and the dread of retribution an absurdity. It would, too, always remain an insoluble puzzle how this belief came to be universal and to acquire stability, how it grew into an indispensable reality attested by the consent of all peoples.[31]

This point of view also postulates the resurrection of the body. In this life body and soul have been partners in weal and woe; it is reasonable, therefore, that they should share the same fate in the next life. The soul can, indeed, subsist of itself, but, since it was created to be united to the body, it cannot be separated from the body for ever. S. Thomas, however, considers this proof only a *signum*, that may be presumed. It derives its full strength from faith and revelation, to which province the doctrine of the resurrection of the body wholly belongs. Here it need only be noted that the body is by nature mortal, although by a special gift of God, it was primitively endowed with immortality. Hence it will rise from death, not in its present or in its ordinary natural state, but as a glorified body. Physiologists assume that the matter of the body

30 Max Müller, *Essays*, Vol. I., p. 212.

31 Schneider, p. 42, 29. Knabenbauer, p. 157, 164. Girodon, *Exposé*, Vol. II., p. 213.

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changes from every three to seven years. This change may serve to show that the form and nature of the body are above and independent of the individual atoms and elements. The body, therefore, that will rise again will not necessarily be identical with the constituent particles that now compose it. The resurrection of the body has been the great stumbling-block of ancient and modern unbelief, and of the old and new rationalism. It will always be difficult for the human mind to grasp it, but science cannot demonstrate its impossibility. He who believes that the living God created man, will not question His power to raise the dead to life. Christ overcame death for Himself and for us. As Christ rose again, so we also shall rise again.

The proofs for the immortality of the soul and for the existence of God lead us across the frontier of faith. They breathe the air of faith. Immortality is such an obvious and necessary foundation for all faith and religion that there was no special need to give it a prominent place in either Scripture or Tradition. But, in order to stop the mouths of Italian philosophers who contended that Aristotle denied the immortality of the soul, the Council of Vienna made it an article of faith. No decision, however, was come to respecting Aristotle's attitude in the question.[32] A similar opportunity presented itself to the Lateran Council in 1512, which, however, merely condemned certain philosophers who asserted that pure reason has no right to say that the thinking soul is not mortal. In the decisions against Traditionalism, the knowledge of the soul's immortality was enumerated among those things that can be attained by natural reason. Lastly the Vatican Council, by rejecting every form of Monism, and by drawing a sharp distinction between matter and spirit, indirectly sanctions belief in the immortality of the soul.

32 Kleutgen, *Theol.*, iii., p. 205. Schwane, iii., p. 376, seq.

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CHAPTER XIII.

MONISM.

If there is any force in the arguments advanced in the foregoing sections, Monism in all its ramifications is already condemned. If the proofs are not so convincing as we would fain imagine, the fault lies not in the proofs but in ourselves. Nevertheless we cannot shrink from the task of subjecting the principles and consequences of the Monistic hypothesis to a special examination. Monism is set on deeper foundations than it seems to be. Tossed about on a sea of changes, and distracted by the manifold forms that are to-day, and to-morrow are not, the human mind, like a ship before the wind, flees irresistibly, as to a happy haven, to the theory that assigns a common origin and end to all things. The *one* cause and end of all being is the goal we are making for, when we argue back from effect to cause, or from the conclusion to the reason, or when we seek a point of rest and unity amid ever-shifting phenomena. Unity follows from the idea of the absolute, and from the idea of supreme power and intelligence. Unity is the methodological principle of empirical research. Our knowledge of God, with monotheism for its basis, embodies the principle. Were we even to distinguish between *the* God and God, our "henotheism" would betray a monistic and monotheistic stamp.

It is always difficult, more especially in theorizing on the world, to strike the golden mean. In the world and in man two principles are striving for the mastery,—the material and the spiritual. Unless we can successfully

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blend the two into a higher unity, truth will suffer loss. For we shall fall into one extreme or the other—the materialistic or idealistic view of the world. Materialistic Monism evolves everything from dead matter, atoms and motion. Even the intellectual and moral life it considers the product of material causes. Idealistic Monism makes the absolute, in its most general signification, the source of all things,—mind being the highest point in the evolution of universal being. Both theories efface the specific distinction between matter and spirit. Both regard thought as identical with being. Materialism drags down thought to the level of matter, by making it a mechanical movement of material particles. Idealism raises matter to the dignity of thought, by making it play an unconscious part in the intellectual process. Materialism degrades man to a level lower than the brute, and becomes in its practical form Epicureanism and Egotism. Idealism makes man a god indeed; but a god who, during an eternal evolution, appears as a wave on the surface of the ocean, that speedily disappears in the flood, and is absorbed in the unfathomable and unconscious absolute.

The two Monistic systems have a long history, of which we cannot give even a brief epitome. A few hurried notes, a brief outline of their progress, must suffice. The atomistic, the hedonistic and materialistic theories owed their widespread diffusion in antiquity to Empedocles, Democritus, Epicurus and Lucretius. The Eleatic school, with their absolutist notion of unity, strove to satisfy the human mind in its innate tendency towards Monism. The Stoics, with their universal substance and absolute conception of morality, gathered under their banner the better classes of a corrupt society. Philo aimed at reconciling supernatural revelation and natural reason, but distilled Theology into a sort of Pantheism. The divine *Logos*, as the impersonal reason of God, is, in his view, the logical unity of the world. The ideal world is far above the real world, but the final explanation of both is to be found only in Plato's Monism. The Neo-Platonists pushed Platonism to its

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ultimate conclusions, and strove by semi-pantheism to overcome Christian objections. Even strict Dualists, like Gnostics and Manichæans, could not altogether tear themselves asunder from Monism. They, indeed, represented the two principles as sharply antagonistic, but in the long run made them emanate from one principle. In their theory God is not above the turmoil, but is actually drawn into the struggle, and forms part of the evolution. Necessity ousts freedom from things material. *One* end is the goal of separation and redemption. The entire process by which matter and evil are destroyed points towards the same goal. A common beginning and end is recognized even by the Iranian Religion, the mother of Dualism. The Christian theory is a tempered Dualism. It admits that soul and body, God and the world, are specifically distinct, but it holds fast to unity amid distinction. It denies identity, but reconciles rival interests. But Monism has always been a power outside Christianity. In non-christian philosophy, Pantheism, too, has ever played a part. Scotus Erigena and many one-sided mystics bear witness that it has gained a footing even among Christians. Some have even gone so far, unjustly no doubt, as to impute to the Schoolmen a leaning towards semi-pantheism. Modern philosophers have mostly adopted the spiritualistic philosophy introduced by Descartes. But the names of Spinoza, Hegel, Fichte, and Schelling are an ample guarantee of the widespread dominion of Pantheism down to the most recent times. Its empire was in part broken and in part extended by the mechanical Monism which Bacon, Descartes, Gassendi, Hobbes and Locke planted, and which has firmly taken root in modern science. Monism in this form has dug deep down into the strata of society. It is a watchword echoed even in the ranks of believers.

Mere materialism is too gross to need refutation here. However gorgeous be the attire in which it is paraded, it cannot captivate any thoughtful mind. The degraded masses and the riotous liver find in it a religion congenial

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to their tastes. The former are thrown into the arms of this melancholy creed by destitution and every kind of misery ; the latter see in it a justification of their manner of living. With the spiritual and moral life these men are either wholly unconcerned, or treat them as careless trifles. If a tree is still to be known by its fruits, the character of this Monism will deceive no one. It opens wide the door to sensuality and selfishness, loosens the ties of family, and leads to the disruption of state and society. If by any chance it ever attains universal dominion, religion and morality will be a heap of charred ruins.

Mechanical Monism is also materialism in its consequences, but tries to ensconce itself behind the fortifications of reason, by laying down general laws to compass all events. Philosophers of old distinguished in things a constant element, the substance, and a fleeting element, the accidents. The former was the type that stood firm and unmoved amid the general flux ; the latter were washed away, changed or devoured by the blind waves and surges. They knew not how the accident inhered in the substance, but they accepted the inherence as a fact. Nor did they draw back from admitting substantial changes also. Modern science, however, has blown accidents to the winds, by blending the notions of substance and matter, and by viewing the changing properties of things as effected by the corroding action of the material substance. To account for effects produced on the subject, ancient Natural Philosophy ascribed *qualitates occultæ* to the things themselves. Modern science regards these qualities, not as something absolute and real with an existence of its own, but only as relations of things to one another. Thus colour, sound, taste, and the like, are merely states of consciousness, effects on the organs of sense. Ancient natural philosophy found the essence of the soul in the immaterial psychic substance that was the subject and cause of the several faculties. Modern science finds the essence of the soul in "a general total state resulting from "many previous conditions and their relations, in which the

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"*general* state becomes the law of thought, feeling and "tendency. So there is no soul before there is under-"standing, taste, and character." The soul is the interior, the body the exterior of one and the same thing. Bodily and mental acts are merely different effects of the same cause. In all the spheres of being and life, both conscious and unconscious phenomena are regarded as effects of matter, viewed either materially or dynamically. Or, again, phenomena are different complications and blendings of the elements which come together according to their position and inclination, and separate again to form new combinations.

In spite, however, of its fascinating appearance, its stately strut, and the solemn imposing airs it assumes, Monism cannot unlock the world-puzzle, or even unravel the microcosm. It is incompetent to explain the beginning of being, the origin or the various forms of life, the unity in variety, or the variety in unity. Without assigning any reason, it handcuffs the spiritual life with mechanical laws. To the question : what is sensation or feeling? it says it doesn't know. When questioned about consciousness and self-consciousness, it gives the same satisfactory and soothing answer. When, in despair, we put the further question : what are will, freedom, and duty? it whispers confidentially into our ears : *Ignoramus et ignorabimus*. Thus the entire range of life and humanity is doomed to be wrapped in a winding sheet, and nailed down in a coffin of ignorance, for all eternity. Positivism modestly limits our knowledge to the finite, and supposes the finite cannot be considered otherwise than monistically. But it must confess that our knowledge of this finite, according to our mental and natural condition, is and will ever remain infinitely small (Nägeli). Science must not ignore the soul-elements, unless it is to confess its own incapacity, and renounce all satisfactory explanations. To explain atoms dynamically does not help us much, for the dynamic theory cannot make a bridge from mechanics to consciousness. Mental life has snatched from the jaws

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of monism the concession that animated matter is unproveable. Besides, it only puts the problem a pace further back without solving it. Spaceless atoms, and an inner spiritual life pervading all matter[1] lie outside the orbit of exact science, and can never be made intelligible to the mind. If all things have souls, and if animated bodies stand in contrast to the indivisible soul, a sort of Monism, in spite of consciousness, is indeed preserved, but all understanding of the soul and the corporeal world is sacrificed. In that case there would be two parallel developments, but not the development of spirit from matter. There is no explaining how the unity of conscience results from the diversity of soul-elements, and their unconscious perceptions. The resultant of spiritual forces is just as little able to dispense with a starting point, or to change the kinds of force, as the resultant of physical forces. Mechanical Monism is really fraught with the same consequences to the moral life as gross materialism, but it is not so open and cynical in avowing them. No adequate motive can be assigned for moral obligations unless the soul have a specifically higher life than the body. As this Monism is the view embraced by the educated, the actual consequences may be, perhaps, less crude and revolting. But the lower strata of society will explain the "new faith" of the cultured classes in their own way.

From Monistic Animism to Pantheism the way is short and easy. In one form or another Pantheism lies at the root of modern systems. New Pantheism differs from the old more in method than in substance. Nowadays the *a posteriori* method alone is possible. A system of metaphysics that does not rest on a fair physical basis, is laughed to scorn as a castle in the air. *A priori* constructions have been thrown overboard, and metaphysics are viewed with distrust, precisely because the immoderate *a priori* speculations of Pantheist philosophers of this century contradicted the certain results of science. Kant's *Kritik*, by

1 Lotze, *Microcosmos*, I., p. 405, II., 47.

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separating the substance from the phenomena, and withdrawing it from cognizance, shook the foundations of knowledge. By pushing Kant's principles to their extreme conclusions, Pantheists obliterated the real world, and constructed a world of their own from idea and thought. In their view, all being is dependent on thought; the inner world is the cause of external phenomena, the universal of the individual. As a necessary consequence they deny the reality of the world. The "School of Reason" (Cousin, Saisset, &c.) profess to give a more exact analysis of the contents of consciousness. But by starting from a rational intuition and constructing being from thought *a priori*, it cuts the ground from under its feet, and has nothing to stand on when accounting for nature and being. Even if it transfer its starting-point from consciousness to internal experience (Frank, Janet, Boullier, Caro, &c.), the material and external world is still undreamt of in its philosophy. The psychological school, which has lately picked up many recruits, is wrecked on the same rock.[1] If the existence of the soul be assumed, that, at any rate, is something real and perfect, a centre from which philosophic speculations may radiate. Thought is the best thing in nature. Its ultimate reason lies in the absolute perfection. The soul is understood in God, and nature in the soul. Thus we may vanquish materialism by contemplating all things in the human soul, but there matter ceases and becomes mere force. The ultimate consequence of this spiritualism is idealistic and pantheistic. Finally, if Pessimism be enthroned, and the "will" or "the unconscious" be made the chief factor, the spiritual and moral life totters and falls. There can be no longer any question of giving a reasonable account of the world and its inhabitants, for they are an insoluble enigma. 'Twere better for them not to exist.

Pantheism, as this form of Monism has been called since the days of John Toland, sets out with the idea of being,

1 See Elie Blanc, *Un spiritualisme sans dieu*. *Controverse*, 1885, June and July, Pressensé, p. 26, seq.

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without distinguishing between the different kinds of being. Thus there is the purely ideal logical being, and the general objective and physical being; the universal and indefinite being which reason recognizes as underlying all things; and the transcendental infinite being which is the cause and author of all things that are; all these the Pantheist conceives as one. The Traditionalist's point of departure is also the idea of being, but it is the absolute being, God. Others hold that the rational idea of the absolute is the real principle and foundation of our knowledge of God. Both these schools, however, are loud in declaring that being cannot be deduced from thought, nor the absolute from the indefinite being. But the Pantheist's first being is the possible not the real. With him the unreal and the non existent is the absolute beginning. He makes the unconscious the cause of the conscious, and the general the cause of the particular. Thereby he abandons all hope of explaining the laws of causality, and of the conservation of energy, as well as the beginning of things, or rather of being, which is at the same time *non-ens*. Thus universal being becomes the beginning of development. Although it is nothing it can become everything. If we try to fix the idea of *ens purum*, it is, indeed, shown to be identical with nothing. This, however, is not the true concept of the absolute being. *Ens purum* is a pure abstraction, a logical creation, with no corresponding reality. Is this concept of universal being to be the cause of all other being? Why should this being become everything? How can it be individualized in divers things? It mocks our frustrate search for a reason. For if *ens* is identical with *non-ens*, the further idea of "becoming" (*fieri*) can arise only in the heat-oppressed brain of the philosopher. But the process of *becoming*, so far as it has been observed in nature, is never a transition from nothing to something, but from one mode of being to another. The cause, at the very least, must be on a par with the effect. A cause can produce an effect lower but not higher than itself. Therefore indefinite can never develop into

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definite being. Individuals as such can never exist if they are but the phenomena of one and the same thing. In Pantheism individualization is inconceivable. And yet, as we everywhere see, individuality is the basis of nature. The union of forces originally separated begets higher knowledge and higher realities. Were there no monads, says Leibnitz, Spinosa would be right. Either the Pantheist regards individuals as parts of the Infinite, or he must admit a substance distinct from the phenomena. In the former alternative, many finite, dependent and contingent parts added together will never yield an infinite and universal, much less an absolute being. If he embrace the latter alternative, he cannot know or predicate anything of the absolute, since its phenomena alone are real. Nothing now remains for the Pantheist but to say that the real world alone is finite, and that the idea of it, the "will," and "the unconscious," are simple, perfect, and infinite. In the absolute these ideas have consistency and meaning. But as long as the universal in the abstract is the starting-point they are empty sounds. The distinction between real and ideal being, and the real and the ideal world is right and just, but it has a real basis only when the idea itself is real,—the truly existing and all real. The ideas of the world and of individual beings existed from all eternity, and were realized in time; but they were actual and effective ideas, not hollow abstractions. They can exist in a spiritual subject only. Truth, indeed, has its principal seat in knowledge, but the thing known does not owe its existence to knowledge. If things did not exist in themselves, thought could not represent them. That is true which is, says S. Augustine. But man can arrive at the knowledge of the truth only by establishing a correspondence between mind and object. That alone which is the absolute being can, by its mind and will, give existence to all. Natural causes can produce *one* effect only, and that must pre-exist in them potentially. The cause of many and divers things must be essentially distinct from the things themselves.

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As Pantheism is at a deadlock in regard to individualization in general, so it is at still greater loss to explain the individual life of the soul and spirit. It is easier for Pantheism than for Mechanical Monism to assume a basis for the soul's acts; but it always remains a still-born assumption. "Everything is reasonable, and whatever is reason-"able is real." This is tantamount to saying that matter, the individual consciousness and self-consciousness, are enigmas of which no solution can be given. If the world is no more than the idea of the *non-ego* (other being) we must fall back on the world-soul of the ancients. But this, again, blocks the way for the individual consciousness. If thought and being are identical, the soul must be both corporeal and absolute: corporeal, because it knows the body; absolute, because it knows the absolute. All souls, too, would be identical. As the distinction between soul and body, between particular and universal being is wiped away, so there would no longer be any distinction between soul and body. By what manner of means is the individual, conscious, and self-conscious being to be evolved from universal unconscious being? What causes this striking evolution? What is the reason that this individualization is more complete in one part of universal being than in another? Experience shows that the march of the individual towards self-consciousness is dependent on external influences. Yet, even if it were not so, there would be no analogy between this and the development of the universal and unconscious into individual consciousness. As a matter of fact self-consciousness is attained only by those particular beings which from the first were disposed as human beings. All other theories, as was shown above, have no sufficient *raison d'être*. They are built not on the rock of experience but on the shifting sands. It is a general truth of experience, which holds good here also, that the real and the perfect go before the possible and imperfect. What happens in the individual has its principle and cause in the universal. The infinite cannot have evolved itself from the infinite. It must be

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considered as something absolutely real from the beginning. Conditional self-consciousness and a relative personal being in a number of individuals are conceivable in the supposition of an absolute self-consciousness and a personal absolute : but they cannot be conceived as emanating from an universal unconscious being.

Why, however, should universal being stop short at human self-consciousness? Is not the whole universe to be conceived as capable of endless progress? Individuals are carried down and submerged in the stream of time; but once a general progressive development is admitted to be necessary, the whole should make unlimited progress. But natural science shows that this universe is slowly but surely coming to an end. Pantheism is wholly unable to explain the process of thought in design and purpose. Were the unconscious the cause of thought and being, then the will could not play so important a part in the sphere of action, nor purpose in the universe. A consciousness of voluntary activity pervades the psychic process, from the first desire of a result till its complete realization; and this consciousness is at its strongest in the creations of the mind.[3] Sense-perceptions may be half unconscious, although, as we know by experience, even the strongest, if no attention is paid to them, pass by unnoticed. But to rise from sense-perception to a concept, a positive act of thought, which involves attention and determination of the will, is necessary. But if the unconscious and unfree will, such as it exists also in instinctive acts of men, is so productive, then not only must consciousness proceed from the unconscious, but it must also infallibly and uniformly either attain or miss its end in every case. Then Optimism or Pessimism would be the only true theory. Relative good and evil can find no place in Pantheism. Limited, imperfect, and defective being, which is proper to the real world, would be impos-

3 Staude in Wundt, *Philos. Aufsätze*, vol. I., p. 175, seq. Kahl, *Die Lehre vom Primat des Willens b i Augustinus, Duns Scotus und Descartes.* Strassburg, 1886.

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sible, if all things were the result of a necessary development of universal being, and were not freely caused and destined for higher ends. Mechanical Monism has, perhaps, a claim on us, inasmuch as it makes imperfections and defects a motive of development. But Pantheism can plead no such justification, for it begins, not with force and matter, but with ideal being. Unless we are to draw goodness into the whirlpool of natural phenomena, and thus deny moral good, there is no alternative but to include nature in the realization of good.[4] All being, all that goes by the name of form and figure, thing and event, i.e., nature in all its fulness, is but a postulate for the realization of good, and a declaration of its infinite value. How little this theory squares with facts, is shown by the confession, that it is a matter not of cognition but of conviction. From this point of view there yawns "an abyss, "separating the world of reality from the world of forms, "that human reason cannot or at least never has filled in." It is in vain that the new faith seeks in nature the good that the old faith sought above nature in spirit.

Monistic Pessimism, in its turn, finds a mystery in relative goodness. To deny it altogether would be rash, and in manifest contradiction with everyday experience. Such a denial would argue either subjective bias or mental disease. To poise the older Gnostic and Manichæan Pessimism, the Fathers placed in the other scale the goodness and beauty that undeniably exist in men and things. The world, they said, was not so bad as the Pessimists painted it. Look where we will, in the heavens above or on the earth below, whether we contemplate man or any other living creature—all, with one concerted voice, proclaim the goodness of the creator. The Fathers found their chief delight in steadfastly gazing on the beauties of nature, and in contemplating the heights to which human thought and will ascend. Were it not so, however, and were we even to suppose this to be the worst of worlds, we should

4 Lotze, Vol. I., p. 447; II., p. 454.

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be no nearer to its origin and condition. After all, Optimism and Pessimism are merely two aspects of the same principle. They are two opposite consequences arising from the unification of individual being. As the opposition between being and not-being has to be surmounted at the outset, so antilogies arise in the process of development, that have to be reconciled into a higher unity. If, however, a misapprehension of being and unity lies at the root of the unity of being established by the opposition between being and not being, then such a unity would obliterate all opposition between opposites, and the reasonable would be identical with the unreasonable, the good with the bad. Pantheism transfers to the whole world that identity of being and thought which exists in God alone, and shuffles on the absolute[5] the processes of thought and of becoming (*fieri*), which are proper to the finite. It makes the absolute finite, and the finite absolute. It slurs over the actual difference between good and evil. Hence it is now frankly admitted that the paths struck out by Kant's disciples end in a *cul de sac*.[6] Pessimism ripened in the sunshine of popular favour, not because it was Pantheism, but because it gave utterance to the general misery, and moved the murmuring lips of discontent. In times of religious indifference and moral decadence the absurdest views, as a rule, are most relished. Now, however, that Mechanical Monism is pronounced inadequate to account for the spiritual and moral life, it follows that no kind of Monism can be satisfactory, except to those who, with Lotze, consider all explanation hopeless, in spite of their sneaking regard for Mechanical Monism. Anyhow, at the chief turning-points of existence, Monism leaves unexplained the principles of simplicity and multiplicity, of harmony in diversity, of constancy in change, of causality among infinitely numerous effects.

In this way we again veer round to that Dualism which

5 Kleutgen, Philos. II., 2, 34, 401, 447, seq.; I., p. 536, seq. Pesch, II., *Welträthsel*, p. 25, seq.

6 Liebmann, *Anal.*, p. 223.

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preserves unity in the midst of distinction. To be intelligible the world must be conceived as the effect of an absolute cause, as the work of a personal Creator. Can, then, this Dualism, which lies at the root of Theism, be traced in every minutest detail? This is quite another matter. Aristotelian Schoolmen made the attempt by resolving all created things into two partial substances, distinct but mutually dependent,—matter and form. This is not the place to discuss these terms and their application.[7] This one point, however, may be noted: matter, unable to exist in itself, but destined to be real and capable of becoming everything, is in itself quite as inconceivable as the Pantheistic universal being, which is nothing. Naturally the possibility or potentiality in a compound being must be real, but it eludes experience and baffles evidence. The form is equally unable to exist in itself. It, too, must be educed from non-existent matter. The principle of individuation, though recognised, is still unknown. If, again, as the Thomists maintain, matter is the principle of individuation,[8] the individual is capped with a still denser mist. But the flaw lies more in the theory than in the principle. In point of fact nothing exists that is not compounded of matter and form. The two have been blended together ever since the first being set foot on earth till now. Neither is it necessary to assume that in the physical and chemical processes, there has been a continuous change of form. It is very probable, according to modern physics and chemistry, that all phenomena may be explained by the condition and motion of atoms and ether. No further hypothesis is needed even for crystals. But with life an essentially new factor appears on the scene, which imperatively calls for a higher form. At this juncture Mechanical Monism can no longer appeal to the existing forces and laws of nature. It matters little whether this new form be called *forma substantialis* or *anima vegetativa*, or vital force, or plastic tendency, or any other name.

7 See *Theol. Quartalschrift*, 1885, p. 20, seq.
8 See Glossner, *Philos. Jahrbuch*, 1886, Nos. 1 and 2.

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There is this advantage in the Scholastic theory : the form never assumes the semblance of anything external and accidental. The Schoolmen agree with modern science in enshrining the cause of life in the essence of the thing itself. Thus every living being is clearly one and whole, and all vital functions must flow from the whole. The form is the active principle which governs the material elements, and subordinates physical and chemical processes to its own ends ; but it is so in virtue of being a partial substance of the whole being. In like manner, the Scholastic theory of knowledge stands midway between the two extremes. Sense-perception, not thought, is its starting-point. It assumes neither the identity nor the absolute diversity of the grades of being, but only their unity of resemblance. The thing known is determined by the manner of the mind that knows (*ad modum cognoscentis*). Hence thought is not identical with the being of things ; and yet the two are connected by the correspondence between mind and object. Thus analogy has a wider range in natural and divine knowledge. That knowledge is possible must be allowed even by the man who doubts, if he have faith in his doubt. But it is possible only on the supposition that object and subject are referred to each other. Again, this relation requires God to be related to the world, as its cause and end. From the first there must have been mutual relations between the world and the thinking *ego*. They did not emanate from the absolute, but were created. They are both limited. They are not manifestations of the absolute, but are subject to it as their aim and end. This gives us an insight into the structure of the material and spiritual world, which involuntarily moves man to worship the almighty and all-wise Creator. Monism is a comfortable creed for all who deny a future life, who set up immortal matter instead of the immortal soul, who dethrone God and crown man as the only being in whom the infinite attains self-consciousness. But Buddhism shows into what straits man may be driven by reliance on his own strength. The high-blown pride,

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that almost unconsciously peeps through his thoughts, brings him to the brink of the precipice over which Buddha fell. His only hope of redemption from the miseries of life is in Nirvana, the gloomy and cheerless nothing. Such a Nirvana, however, as experience teaches, has no practical hold on the mind and heart of man, which thirst for the living God as their true end and happiness.*

The Vatican Council was induced by the widespread prevalence of Monism in modern society to confront it with the old doctrine of the natural knowledge of God. The first chapter of the Constitution on Faith treats of God, the Creator of all things. In the original draft of the *Schema*, the title had express reference to Rationalism. Rationalism in all its Protean forms is to be rejected. There is the gross rationalism, which denies the existence of God; the ordinary rationalism, which admits natural knowledge only; the semi-rationalism, which admits supernatural revelation but makes reason the measure and judge of its contents: all are to be shunned. The first is the only kind with which Monism is concerned. The first section of the first chapter aims a blow at this form, by ascribing to God such attributes as are in direct contradiction to Pantheism. God is there defined as an absolute, self-conscious, free spirit, "who, as being one, sole, absolutely "simple and immutable spiritual substance, is to be de-"clared as really and essentially distinct from the world, "and ineffably exalted above all things which exist, or are "conceivable, except Himself." In the Canons subjoined

* "What was the original meaning of Nirvâna may perhaps be best seen from the ety-"mology of this technical term. Every Sanscrit scholar knows that Nirvâna "means originally the blowing out, the extinction of light, and not absorption. "The human soul, when it arrives at its perfection, is blown out, if we use the "phraseology of the Buddhists, like a lamp; it is not absorbed, as the Brahmans "say, like a drop in the ocean." Although "annihilation" and not "union and "communion with God, or absorption of the individual soul by the Divine "Essence" was the original meaning attached to Nirvâna by the first disciples of Buddha (of Buddha himself?), yet it would seem to have soon given way to the second meaning. From the earliest times Buddhist philosophers and Buddhist teachers have "propounded every conceivable opinion as to the orthodox inter-"pretation of this term." See Max Müller, *Chips from a German Workshop*, pp. 280–291.—*Tr.*

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the several kinds of Monism are condemned. Firstly Atheism, as the common principle pervading all Monism, is condemned. In the second canon anathema is launched against those who do not blush to assert, that nothing but matter exists. The condemnation of this gross materialism would be superfluous, were it not the ultimate outcome of Darwinism. The third Canon is directed against ontological Pantheism, which makes the being of God and the world substantially identical. The fourth Canon deals with the various forms of this Pantheism, which is at the bottom of atheism : for if everything is God, there is no God. Some make finite things, both corporal and spiritual, or certainly the latter, emanate from the divine substance ; others contend that the divine being, by manifestation or evolution, becomes everything ; others, again, contend that God is the universal indefinite being, which by self-determination divides all things into genera, species, and individuals ; all are included under the same ban of condemnation. Brahmanism, Neo-Platonism, Gnosticism, and Eastern religions generally taught emanation and evolution ; modern Pantheism teaches the self-determination of the universal and indefinite being. To all these untenable hypotheses, which are in a greater or less degree atheistic, the Vatican Council opposes the teaching of Holy Scripture as the only true doctrine : the world, and all things in it, both spiritual and material, according to their whole substance, have been created by God out of nothing. Of His own free-will, without any necessity, God created the world for His own honour and glory.

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CHAPTER XIV.

CREATION.

Although the course and drift of our previous enquiries has forced upon us the idea of creation, the explanation of that idea belongs more to theology than to science. Science shows its necessity and, like a finger-post, points out the road. But it cannot cross the frontier unless provided with a religious passport. Genesis, the oldest religious document, opens with a brief but majestic narrative of the creation of all things—the universe, organic life, and man. "In the beginning God created heaven and earth." This first verse of the Bible, so short and so simple, contains the grandest and deepest truth about the world that philosophers have ever conceived or uttered. With one stroke it hews down and fells the knotty and cross-grained problems that are rooted in Oriental religions, Greek philosophy, and human life.[1] All things, in heaven and on earth, were called into being by God's almighty power. There is one self-existing, all-powerful God, unconfined by time and space, who has given existence to things that before were not. Heaven is not God, but a work of God. Father Heaven and Mother Earth were created by the Almighty. Such is the gist and weighty import of these few words.

Does the verb *bará*, *ἐποίησεν*, *creavit*, mean creation from nothing? Or is it indeterminate? Jewish and Cabbalistic commentators, R. Kimchi and others interpret it: *creavit ex nihilo*. Aben Ezra declares against Kimchi, be-

1 See S. Ephrem, Gen. I., n. 4.

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cause the same word means *formavit* in verses 21 and 27, and has yet another meaning in *Numbers* XVI., 30. In *Josue* XVII., 15, 18, *bárâ*, as later writers have pointed out, is used in the sense of "felling trees." Here, however, it should be noted that the verb stands in *Piel*, and thus retains the primitive signification to "cut" or "cut out." In the meaning of "create" it is used of God only, and no material out of which the object is made is ever specified. In verses 21 and 27 it stands for the creation of man, and of the monsters of the deep. Their creation, however, included a vital principle as well as formation from earth. Nevertheless we are debarred by the *asâh* of verse 25 from extracting the idea from the word alone. The idea itself is foreign to human thought. But with the aid of Biblical teaching about God's nature and action, it will be seen that this interpretation did not merely start in opposition to Greek Alexandrine philosophy, but was intended by the sacred writers. From this time forward it is a Scriptural characteristic of God, that He is not powerless like the gods of the heathen, but created heaven and earth in the beginning. Certain expressions in the Sapiential Books* relative to Greek philosophy, seem to darken the clear idea of creation, by laying stress on the designer rather than the creator of the world. These few passages of later writers, however, even if thus weighed, cannot turn the scale against the clear and universal teaching of Holy Scripture. Ambiguous expressions are to be checked by clear and certain teaching. The oldest account of creation, however, clearly distinguishes two stages in God's act of creation. "And the earth was void and empty," says the second verse of Genesis. This much discussed *Tohu Va Bohu* dispenses us from the necessity of having recourse to external matter, as it provides the shapeless matter from which God formed the earth.[2]

The mode of creation, however, is still unexplained. The human mind naturally inclines to assume a material

* Wisdom, XI., 18.

2 See II. *Mach.* VII., 28; *Hebrews* xi., 13.

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connection between the Creator and the created thing. But as the absolute, immaterial, and spiritual being of God is thereby imperilled, the connection, though real, must be conceived as metaphysical. Any explanation of the world that is to withstand the beating waves and winds must be built on the absolute self-existing being. All relative being is communicated, is being by participation (*esse participatum*). It derives its being from the absolute being, and exists only so long as it is preserved and sustained by the absolute. If the absolute were to withdraw his supporting hand from the finite, all creation would crumble to pieces and fall into nothing. This is a principle common alike to Theists and many Pantheists. The Pantheist also says that if all finite things are mere creatures of the eternal, their fate is determined by the whole. Those things, which by their nature and purpose are a necessary link in the chain of the physical order will last for ever; all that have not this saving value will perish.[3] The Theist speaks more clearly and concisely when he says that the will of God is both the reason why things are, and the measure of their duration. This theory has, indeed, been roughly handled and mauled by modern science. The law of the conservation of energy, and the constancy of atoms or elements is thought to give it the lie direct. As nothing comes from nothing, so something can never sink into nothing. But the contradiction is more apparent than real. Both Holy Scripture and ancient philosophy are agreed on the principle: *ex nihilo nihil fit.* When they teach that God made the world out of nothing, they in nowise set up a causal relation between the world and nothing, but merely deny that the world was formed from pre-existing matter, or from the divine substance. Before the world there was nothing. The world came after nothing. This purely formal doctrine is materially completed by the further doctrine that God created the world by his will. The essential element in

3 Lotze, *Microcosmos*, I., p. 439.

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the notion of creation, which heathen philosophy ignored, is the sovereign will of God. *Ipse dixit et facta sunt; ipse mandavit et creata sunt.* He spoke and they were made, he commanded and they were created. The man of faith may, but the man of science cannot, tear down the veil, and penetrate into the inner court of the act and process of creation. Here, however, we cannot forbear to sum up the results of our previous investigations. By comparing nature with the life of the soul we come to the conclusion that an absolute, self-conscious free spirit must be the cause of the world. By comparing the achievements of the absolute cause with those of man's limited will (which is dependent on the organs of sense for the execution of its behests), we are justified in concluding that the sole will of the absolute, independently of all things outside it, carries out its own wishes. The artist who chisels his ideas in marble is but a pale figure of the sovereign artist, originator of human art, whose idea calls into being that on which his ideas are stamped. The artist is improperly said to create. The work of the Creator is a creation in its plenitude, the first model of all artistic creations.

The will of God is not arbitrary or capricious. The skilful artist reproduces the ideas which he has drunk in from nature, and churned in his mind. God is also a skilful artist. In Him wisdom and almighty power are one. Is not this, some one will ask, an argument from analogy? And are not arguments from analogy the weakest of all arguments? We would put the counter-question: Would not thought come to a deadlock if analogy were forbidden fruit? or if language eschewed all symbolism? If God is a personal spirit, we surely have a right to assume that there are ideas in God, which embrace the universe as a whole, and every individual. Whence came these ideas? Not from nature, or anywhere outside God, for before creation there was nothing outside God. Hence they were in God from all eternity. This is what Augustine meant by *rationes seminales*, the eternal ideas made real in creation. Creation is a copy of

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the life of the divine spirit, a mirror reflecting the eternal ideas. S. Thomas defines creation as an emanation of being from the universal cause, that is God. By this he wishes to give a more vivid picture of creation from nothing. The Pantheistic doctrine of emanation (which he expressly rejects) is far from his thoughts. The intelligible world is the idea of the world in God. Emanation is the realization of this idea outside God.[4]

Were not the phrase open to misconstruction, one might be tempted to say that the eternal ideas have been realized *in time*. What is time? What is eternity? Where is the crossing from the sea of eternity to the stream of ever-flowing time? It is not our province to treat these ideas exhaustively, but merely in their connection with creation. Every one has the idea of time, both objectively and subjectively, but no one understands it. Aristotle paraphrases the idea without explaining it when he defines time: *motus secundum prius et posterius*. The latest empiric and idealistic theories have failed to disprove the saying of Petavius about time and motion. It is flowing and fleeting, and without firm footing. For this reason time and motion are a hard and gnarled problem. The ablest philosophers shrug their shoulders when questioned as to its nature and bearings. Eternity is a still harder nut to crack. The idea of the infinite is, indeed, current in speech, and enters into mathematical calculations. Is there an actual infinite outside God? On this point philosophers and mathematicians are at loggerheads. We may, if we will, conceive it merely as an indefinite infinite; or we may leave mathematicians in peaceful and blissful enjoyment of their infinitely great and infinitely small quantities, for which there is some foundation. Anyhow their infinite is but an abstract quantity, which brings the knowledge of the actual infinite being no nearer. If time be hammered out *ad infinitum*, so as to stretch to the sides of the world; if the beginning be removed to an immeasurable distance

4 Knauer, *Psychologie*, p. 60. See Tertull. *Adv. Prax.* c. 5-7. Möhler, *Athanasius*, I., p. 49.

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from the end, what is the upshot? Merely an indefinitely long time; not eternity. Eternity is only reached *per viam negationis;* that is, by cutting off beginning and end, eliminating succession, and sweeping into oblivion past, present and future. Eternity is the absolute present. Whether time be objective in things, or only inherent in our perceptions, our mental acts at any rate are successive, and our thought discursive. Hence we cannot get a firm grip of the present now (*nunc*). From the analogy of our own ideas we may infer eternity, but not properly conceive it. The perception of sensible phenomena requires absolute space, absolute time, absolute motion. For us these ideas have a transcendental meaning; they are bound up with the peculiar organization of our intuitive intelligence. They must be regarded as absolute ideas. Although speculative reason be incompetent to argue from the transcendental ideal to the transcendental real, the analogy of human thought justifies it. An absolute intelligence, for whom there is no time, for whom *prius*, *simul*, and *posterius* are not walled out from one another, is possible and must be real.[5] Nevertheless it is difficult to explain the temporal world from the eternal ideas. And yet we must defend the eternity of ideas against Materialism, and the existence of the world in time against Monism. We must say, therefore, that God did not create in time, but that He created things, which are subject to the law of temporal succession. He created a spirit, tied to succession in its acts, which can only distinguish things successively. With the world, as Philo, Augustine and others have said, God created time also. This is the only way to swim across the surging notion of creation. The Manichæans used scornfully to ask the Christians: What was your God doing before creation? S. Augustine rightly put this

5 Liebmann, *Analysis*, p. 126, 184. *Gedanken und Thatsachen*, p. 75, seq. Dubois-Reymond, *Allgemeine Functionentheorie*, 1882, vol. i., p. 190. See ibid. the doctrine of the infinitely little, p. 72. It is especially defended by Gutberlet and Cantor. See *Natur u. Offenb.*, 1886, p. 46 seq. On the other side: isenkrahe, *Das Unendliche in der Ausdehnung. Zeitschr. für Phil.*, 1885, vol. lxxxvi. p. 73. On the Aristotelian and Scholastic idea of space and time, see Schneider, in the *Katholik*, No. 2, 1886. Petavius, *De Inc.*, 6, 1, 2.

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down as a silly question. For, as there was no time, but only eternity, neither was there any *before*. Of course this is no explanation; but it is a necessary conclusion from the contingency of things. Augustine sought to reconcile the eternal creative act with creation in time, by conceiving the eternal ideas in God as objective and real, and thus distinguishing the eternity of the world in idea and in its temporary nature in creation. His are not the Platonic ideas which existed in themselves from all eternity, apart from things, and outside God. But they are divine ideas, real and operative by God's almighty will, and well adapted to serve as a medium of human knowledge here and elsewhere. To split the divine act of will into two halves, one eternal and the other temporal, would destroy God's simplicity. The act of will is eternal, but its product is temporal, because it is a product distinct from the divine nature. The temporal character of the thing to be created by the will is included in the ideas. There is no other way to escape being tossed on the horns of Kant's dilemma. If, he argues, the world had a beginning, a void of time must have preceded in which nothing existed and nothing was done. But the origin of the world, as something that is made, implies succession, and therefore one portion of the void of time is not void. If, on the other hand, the world existed from endless time, the totality of times would have already run out; that is an eternity would have passed. Thus Kant. But the eternal ideas are the answer to the first branch of the dilemma, and the Creator's act of will to the second. The idea of a "temporal creation willed from all eternity" can throw a gleam of light on the dark abyss of the beginning. Moreover Augustine, again following Philo, tried to simplify the problem by assuming that creation was one momentary act. To support his view he appealed to a misunderstood text (Eccles. xviii. 1 compared with Genesis ii. 4). But he was chiefly induced to make the "Alexandrine Discovery" of simultaneous creation, by the philosophical and theological difficulties which lay in the way of pre-

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serving God's eternity and immutability in Creation. The idea of succession, indeed, is thus all but eliminated ; but a tincture of mystery remains at the bottom of that one act. The thoughts of the conservation and government of the world, and the uninterrupted activity of the Father and the Son, will always point back to the other explanation of the creative act. Thoughtful natural philosophers now incline to efface every point of time, and to conceive creation as a continuous and ever-present divine efficiency. Unless this conception of creation bears an Aristotelian or semi-pantheistic sense in favour of the eternity of the world, it can only mean that from eternity God conceived the world as temporal, and that its temporal existence began in time. The temporal existence of things, as Hugh of St. Victor observes, is eternally included in the eternal will of God. Origen attempted to reconcile the eternal act of creation with the temporal existence of the world by the converse method of assuming an ever-revolving eternity. This solution, besides contradicting experience, is after all only apparent.

Again, all created beings occupy *space*, but the Creator is infinite and immeasurable, and uncontained by space. What is space? We know as much and as little about space as about time. We cannot realize space either by mere rigid bodiless extension, or by the sense of external and objective perception. The Aristotelian definition makes place and space identical : *terminus continentis immobilis primus.* This definition, however, merely states a known fact. Modern psychological, physiological, empiric, and idealistic explanations only show that in this concept the objective is inseparably interwoven with the subjective. Space everywhere accompanies all things. The mind is nailed down to the law of juxtaposition as well as to that of succession. It can never tear itself asunder from the three dimensions, even were Spiritualism to explain its wonders by a fourth, or Geometry were to prove that four or more dimensions obtain in its own sphere. We are driven, therefore, to suppose that space

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like time is, objectively and subjectively, a condition attached to our knowledge. With time it was implanted in things; and mental cognition is dependent on things. Everywhere we are confronted by the idea of absolute space, and of the Creator, uncontained by space, as the cause. Even space demands the free-will of the Creator.

Created things, as we have already remarked, last only so long as God wills. In other words, the universe has a definite time allotted to it. The more we emphasize God's free will in creation, the more also are we bound to take it into account in the conservation of creatures. There is no denying this conclusion although, on closer inspection, it may be substantially modified. Chance and caprice have no place in the world, being excluded by the absolute wisdom of God's will. God's wisdom has marked out an end for all things, and it has both the power and the will to lead them by the hand to their end. Everything continues to exist till it has attained its end. Though God might repent that He had made man, He could never frustrate His own designs in creation. The plan of salvation is as eternal as the plan of creation. God could not repent creating an unoffending world. It also might be cursed on man's account, but it could not be doomed to annihilation. The whole world is governed by unchangeable laws, in accordance with which the forces of nature work without fail. This proposition, far from jarring with the right idea of creation, thoroughly harmonizes therewith. There is no need for God to be perpetually interfering with the world's course. The idea of creation requires God's will, as the only real power in the conservation and government of the world. It does not, however, by any means require the first cause to work except through secondary and intermediate causes. The government of the world cannot be explained without reference to its creation. The being communicated to things has now become their own. Where they are placed, there they exist and work. Thus God's dominion over the world does not contradict His eternity and immutability. It is finite things that change in their

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relation to God. Omnipotence is, indeed, first known to us by its works in creation; but we need not for this reason follow Origen, Hermogenes and others in supposing a circulating eternity. In God creation produced no change; but it established a relation on the side of the creature to God. Even had God not revealed Himself, He would still be Almighty; but, as the Fathers declared against the Gnostics, he can become Lord, only in and by creation. Not that by creation He became more than He was before, but because creation called subjects into being. Lord is an epithet drawn from time, in the same way as God, without change of substance, became our Father in regeneration. Provided naturalists do not trespass beyond their own borders, they may continue to write the "History of Creation," although they declare the idea of creation to be scientifically inadmissible. Empiric science and astronomy are as little able to find the Creator in their calculations, as the anatomist is to find the soul by dissecting the body. They reckon with number, weight and measure. Their operations are hemmed in by things accessible to the senses. Empiricism, therefore, may be neutral towards the idea of creation, but it should refrain from taking up arms against it. Once we leave the domain of Empiricism,—and what rational being would be content to grope in it alone for ever?—we find that creation alone solves the world-puzzle. Both creation and autogony are impervious to exact science. There can be no doubt as to the result, if the issue lies between these two. Besides satisfying the requirements of thought and causality better than autogony, creation alone gives full and complete satisfaction. Although it is indispensable, no one must expect it to lead him into God's inner laboratory. Imagination repels the idea. To pure thought, the Schoolmen held, it presents no difficulty. Without going quite this length, we are safe in saying that the difficulty is not insurmountable. It involves no contradiction. "The oldest "book in the world" gives this advice: "'Learn, by shut-"ting thyself up within thine own soul, that the works of

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"God are unknowable. For God will not allow them to "be known.' Speaking of human curiosity, the Talmud "says: 'He who meditates on the things that lie beyond "heaven or under the earth, or on what was before (the "creation of the world), or will take place after (the end "of the world), does not deserve to have been placed in "the world.'"[6] Jerome thinks that the Jews were forbidden to read the beginning and end of Ezechiel and Genesis before their thirtieth year, because they are so difficult to understand.

6 Chagiga, II. 12—See Grätz, *Gnosticismus*, 1846, p. 12.—S. Jerome, *Ep. ad Paulinum*. On the scholastic idea of creation, see Commer, *System* II., p. 23, seq.

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CHAPTER XV.

THE HISTORY OF CREATION.

There was a revealed before there was a natural history of Creation. Moses gave to the Jews a positive history long before man was able to read the book of nature, to decipher the inscriptions in the heavens, or to interpret the historical records engraven on the rocks. Ancient peoples have, indeed, preserved their own traditions about creation, but they are either boiled down to fables, or are too thin and slender to form an historical foundation, or are too closely linked with the biblical story to weigh, except here and there, as independent corroborative testimony. Genesis is, therefore, the only history of creation. At first sight its story is simple and clear; but it is difficult to sound all the depths of its scientific meaning. The believer and the apologist have ever to bear in mind that they are dealing with a revelation which has to be brought into harmony with science. They must know and faithfully apply the true principles of exegesis, lest an exegetical error be trumpeted to the world as a revealed truth. They must, moreover, be able to appraise the results of science at their true value, and to gauge their bearings, lest the teaching of Genesis, when based on solid interpretation, be surrendered or weakened, without reason or necessity.

In every age interpreters have felt that the biblical narrative bristles with difficulties. To Theophilus the story of the six days seemed so majestic and so laden with wisdom, that no man, even were he gifted with ten thousand

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tongues, and vouchsafed twice ten thousand years of life, would be able to do justice to its sublimity. The apologists who championed Christian doctrine against Gnostics and Manichæans, were disposed to regard the Mosaic cosmogony as the most precious pearl of Christianity. The first chapters of Genesis, when their light was contrasted with heathen shade, seemed to shine as the quintessence of all wisdom. And yet neither Tertullian nor Irenæus has underrated the difficulties in which the problem is enveloped. Writing against Celsus, who virulently attacked the doctrine of creation as taught by Jews and Christians, Origen admits that the question of creation and God's subsequent rest are deep and mysterious, and hard to understand.[1] Jerome, indeed, in spite of his remarks on Genesis quoted above, thinks its account of creation, and of the beginnings of the human race, clear. This well-known fact, however, does not materially help us over the stile. The great difficulty of the text lies precisely in the clearness of its wording. Hence most of the Fathers have hazarded some explanation. It is not unlikely that Justin wrote a commentary on the Hexæmeron. Origen, however, is in the van. For the most part he treads in the footsteps of Philo, but most commentators acknowledge him for their leader. Among the Greeks, Chrysostom delivered eight discourses on Genesis, without, however, discussing the first chapter in detail. His commentary on Genesis is, on this account, pregnant with significance. As the purpose in all his homilies is chiefly moral, so here also he is addressing a wider audience from a moral point of view; but the skill of the trained interpreter peeps through the lattices. His exegesis is, when possible, literal. Basil's homilies on the works of the six days are brilliant sapphires. He is orator, philosopher, commentator, and student of nature in one. Scarcely any writer in ancient times has left such charming pictures of nature, which must have been as refreshing as the morning dew

1 Theophilus, *Ad Autol.*, II. 12. Origen, *C. Cels.*, V. 59.

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to an age parched and shrivelled up with barren speculation. Gregory Nyssa wrote a treatise on the Hexæmeron as a supplement to the work of Gregory Nazianzen. On all exegetical questions he and Origen are more kindred spirits than the other two. Ambrose was the first among the Latins to write homilies on the six days. His exegesis has a strong Greek flavour. Jerome says he made a compilation of Origen's Hexæmeron, but that his train of thought is that of Hippolytus and Basil. He seems, in fact, to have been little else but a compiler from Origen and Basil, although he frequently changes the order of the words. Augustine is more independent. His writings on Genesis are numerous. Against the Manichæans he wrote two books interpreting Genesis allegorically, because he did not dare to explain such great mysteries of nature literally. In other words he did not see his way to an historical explanation. In the unfinished *Genesis ad litteram* he again wrestled with the gigantic task; but despite his nice fence and clever thrusts he was overpowered. Once again he took up the cudgels, in the twelve books of *De Genesi ad litteram*. In it, as he himself has confessed, he asks more questions than he answers, but he leaves the unfinished commentary far behind. It is saturated with Origen's Alexandrine ideas. Thus Augustine, in contradistinction to the Greeks, floated the theory of simultaneous creation.

In laying down the principles of scientific exegesis the patristic exponents of the history of creation are more unanimous.[a] First and foremost, they all agree that all parts of Holy Scripture are inspired, whether they be closely or only distantly related to faith. In their eyes Moses is a prophet, like other prophets, but he was privileged by the Lord of all things to recount what was created before he was born. It was the spirit of God who breathed into him this knowledge. God spoke to the Jews by his mouth. The Logos, who was present when all

[a] See *Theol. Quartalschrift*, 1877, p. 636, seq., where the question of the patristic interpretation in matters of natural science is specially treated.

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things were created, used Moses as his mouthpiece. Inspiration guarantees the Hexæmeron to be superior to all heathen cosmogonies. After a spirited panegyric on Moses, Basil continues: "This man, then, who like the "angels was privileged to see the face of God, imparts to "us the words that God spoke to him." Those men, he says, are foolish, who, fancying themselves wiser than the Holy Ghost, in the plenitude of their wisdom, rebuke the Scriptures, and obtrude their own thoughts under the mask of an explanation. For the Fathers, therefore the Hexæmeron is inspired. They hold, moreover, that Moses did not draw his knowledge of the events of creation from the traditions of his ancestors (to whom it was imparted in vision), but from the immediate revelation of God. The thought that Moses owed his knowledge to his own researches never crossed their minds. How, indeed, could he, in the then state of natural science? Such a supposition would not in itself be incompatible with inspiration, if it were said that the spirit of God had aided him in his speculations; but Moses' own account contradicts it. Not only does the categorical and apodictic "*fiat*" tell against it (whatever allowances we make for Semitic poetry), but the contents also are such that no mere natural science could have enabled him to set them down so clearly and with such calm assurance.

Genesis, it may be argued, is an historical book. Should not, therefore, the Hexæmeron be viewed in the same light as the other historical books, the materials of which were supplied by oral or written tradition? In these cases inspiration merely preserved the writer from error, and aided him to select the materials. Much may be said for the theory that God in some way, perhaps in vision, revealed the several acts of creation to Adam who, in turn, handed on the account to his descendants. The various heathen cosmogonies point to a common revelation. A common family likeness runs through the sagas of all peoples. None, indeed, approach the biblical narrative in grandeur and boldness of conception, but they have many

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features in common. The Jews, it is true, had a tradition to this effect. The Sabbath precept, too, which is demonstrably older than Moses, bears it out. This, however, may be reconciled with the teaching of the Fathers, provided their words are not taken literally, nor pressed too closely. Even granting that the Patriarchs guarded old traditions most faithfully and brushed aside current gentile errors, still, without external organization, the primitive revelation could not have been preserved for centuries as intact as a document locked up in state archives. Even the best tradition has preserved only the main outline, not the details. To take a parallel case, how would the details of Jesus' life have fared in the second and third centuries, had the gospels and apostolic letters not been in existence? The answer to this question is not far to seek, if we consider that outside the Bible nothing survives but the apocryphal gospels, a few quotations in Clement, and a couple of passages which Eusebius plucked from the work of Papias of Hierapolis. In Clement's time, even the years in which Jesus was born and died were not known with certainty.

The Fathers, though strongly insisting on direct inspiration, are far from requiring interpretation to be *literal*. Inspiration or divine suggestion is not a mechanical process. It lays a spiritual hold on the mind. It is a mysterious communication which, while leaving divine truth partially veiled, goads on the soul to make further enquiry and effort. God shows his servants the way, but brings them to the higher peaks of knowledge, only after slow and toilsome climbing. Revelation is addressed to the mind of man, and the mind has first to grasp it. Hence the inspired narrative must be adapted to man's comprehension. This was doubly necessary in the case of the Jews who, from constant grovelling on the earth, found it hard to lift up their eyes to the heaven they could not see, or to raise their thoughts above the things of sense. Thus, much in the Hexæmeron is left to man's understanding. Chrysostom thinks Moses' condescension excessive in omit-

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ting, for instance, of set purpose, the story of the creation of the angels and archangels. For as the bird, whose wings are smeared with lime, cannot wing its flight upward, so the Jews, whose thoughts were rivetted to the earth, had no relish for spiritual things. Hence Moses leads them step by step from things visible to the invisible Creator of all things. Doubtless expressions are used that are harsh and grating. But they are used in condescension to man's infirmity; for how can unspeakable mysteries be understood or expressed without them? Basil concedes less and Augustine more to form. In spite of the unfavourable judgments he has passed on philosophy, Augustine speaks of profane science more approvingly than the Greek Fathers. He allows science a voice in these questions, and therefore he dwells more at length on its divergencies from the Bible. The unwary, he says, are so easily deceived, because they are solicitous about the letter of Holy Scripture and neglect its spiritual meaning. But the order in Genesis is so simple that even little ones can understand it. The names of things visible are given to things invisible, because little ones are too weak to understand what is invisible.

But the sacred writers have a further and a deeper reason for thus accommodating themselves to man's understanding. This reason lies in the end and purpose for which they wrote. Leaving profane things to science, they press forward towards their goal, the religious education and salvation of man. The purpose of revelation is to sanctify not to praise those instructed in it. Gliding swiftly past all other problems that transcend human reason, Moses aims, firstly and chiefly, at instructing and educating the soul. The size of the earth, the extent of the atmosphere, the eclipses of the moon he passes over in silence, because they profit man nothing towards his salvation. But Moses relates the creation of heaven and earth, in order to proclaim this truth in the face of those who did not confess a Creator in "heaven and earth," or who reviled His good work because they understood it not. Even the creation

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of sun and moon was relegated to the fourth day, that no one should presume to say that the earth could not have brought forth without the agency of the sun. Not even the day was to be ascribed to the sun, as its cause. From first to last *man* is put forward as the end, both of the narrative and of the entire creation. All things are made ready, so that when man enters on the scene, he rides in triumphal procession as the king and lord of creation. The Fathers are often tempted to speak disparagingly of all things else, and even to brand them as untrue. We must pass over and not pry into things not found in Scripture, for it surpasses our comprehension. The worldly wise talk loudly, and with many words on the nature of heaven. But their words are but wind. One says one thing, another, another. The most persuasive in speech attacks others, upsets their theories, and sets up his own which, in their turn, are knocked down by others. As these men pluck one another by the nose, we may calmly look on and appeal to Moses. We must cast away the wisdom made foolish, if we are to receive the teaching of truth. Truth is indeed rude in speech, but its bosom swells with unerring knowledge. These phrases were called for by the bankrupt philosophy of the time. It would be a gross injustice, on the strength of them, to charge the Fathers with neglecting or despising profane science. Basil, from whom these phrases are taken, thinks that many things were omitted on purpose to set the mind enquiring. He regrets he cannot find out more about the size and distance of the sun and moon. He demurs to have to draw a final conclusion from a few words. For we should not marvel the less at the whole, did we know the detailed process by which these wonders were called into being.

Augustine indicates clearly and concisely the standpoint from which the interpreter is to view scientific questions. As the sacred authors certainly wrote solely for a religious purpose, they wisely refrained from touching on topics not conducive to man's salvation. Thus there lies beyond an

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extensive prairie, in which human science may roam at large. In its own sphere it may obtain results independently of Holy Scripture. Things in nature, since they are produced by an almighty Creator, are shrouded in a thick darkness, which simple statements cannot break through. Nothing is easier than for a crop of different views to spring up. Hence great tact and prudence are required, and it is necessary also to hear the judgment of experts. Reason and experience will enable a man who is not even a Christian, to acquire a solid knowledge of things in heaven and on earth. Augustine praises, undeservedly indeed, the scientific men of his day, for having obtained the best information and certain results on these points. Hence, he says, we must make a careful distinction. The records of Holy Scripture that bear on faith are as immovable as the pillars of heaven. The more they elude the grasp of sense, the more necessary is faith. But in the parts that bear on nature or are connected therewith, exegesis can lay no claim to unlimited sway. Here the interpreter must beware of thrusting his own views forward as the teaching of Scripture. For thus Holy Scripture is exposed to scorn and derision, and unbelievers are supplied with arguments for challenging its authority even in matters of faith. Augustine himself concluded that there is no appeal against the certain results of science. Of course the Fathers were thoroughly convinced that Scripture can never contradict these results. This would be a self-evident truth, even if the Fathers had not given eloquent expression to it.

These principles may be found stated in most of the Fathers. Here they have been discussed with special reference to the natural sciences, but it would be easy to widen their application. In those days natural science was merely a branch of philosophy, of profane science in general. Generalizations would be met by the objection that it is unusual to consider results as sure in the so-called rational sciences. For all practical purposes, as far as we are concerned, it will be enough to investigate how far

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the Fathers applied these principles to exegesis. We shall confine our attention to natural science, which, as a rule, was grafted on commentaries on Genesis. Moreover, we shall, as far as possible, eschew details. For there cannot be an agreement in detail except in so far as the state of natural science at the time would permit. The strangest and most weird opinions are often expressed. But there is agreement on the main points. An overwhelming majority interpret the narrative of the six days literally; whereas Origen, Athanasius, Procopius, Gregory of Nyssa and Augustine advocate a simultaneous creation, the progressive development of which is recorded in the several days.[3] These ways of viewing the Hexæmeron are essentially different; but they only prove how much latitude the Fathers allowed themselves in applying their own principles. This remark applies to the Fathers generally, especially when they are interpreting the Old Testament. The elder Jansenius, in the preface to his Concordance, complains bitterly because the Fathers indulge in such endless dissertations. When, says he, shall I be able to wade through these piles of treatises, this heap of opinions, all different and mutually destructive one of another. The opinions are as many and various as the writers. Eastern and Western writers, the schools of Alexandria and Antioch ventilate glibly and with a light heart the most contradictory opinions. They had run wild with freedom, and hence, for a time, the allegorical sense numbered more partisans than the literal. The prospect before him, no doubt, stirred up Jansenius' ill-humour, and made him see things through a magnifying glass. But it requires long and patient study to realize how widely the greatest Fathers differed on the principles of hermeneutics, and how reluctant they were to reject any new explanations that did not call in question the fundamental truths of faith. Being men of superior intelligence, they were never afraid to illustrate faith with the discoveries of reason. Thus a

3 See Petavius, *De sex primorum mundi dierum opificio* 1, 5, 1. Schwane, ii., p. 284, seq.; p. 556. Zoeckler, *Geschichte der Beziehungen* i., p. 113.

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French savant reproaches his too narrow-minded colleagues, in order to defend Lenormant, who had done good service to the study of the Old Testament history.[4] The appeal to the Fathers is correct, and does not contravene the decree of the Council of Trent which makes it obligatory to interpret Holy Scripture according to the unanimous voice (*unanimis consensus*) of the Fathers. "Matters of faith and morals" remain untouched.

Later theologians are at one with the Fathers, both as to matter and form. When the age of compilers had more or less passed away, theologians began to shield principles from abuse by encasing them in the armour of rigid formulæ and close enunciations. As a body the Schoolmen embraced the same exegetical principles as the Fathers. The few with platonizing tendencies tread on the heels of Augustine. Abelard finds temporal succession in the creative act as hard a nut to crack as Augustine had found it. The majority, however, give their suffrage for the literal sense. Albertus Magnus, thinks nothing can be truer than Augustine's contention. But, in the natural sciences, he prefers to pin his faith to Aristotle, who was so well versed in them. In theory and in practice he loyally followed Aristotle. Phenomena, he says, are not yet sufficiently investigated. But once they are investigated, experience is a surer guide than speculation, which is reliable only in so far as it accords with phenomena. Albertus himself gave a spurt to scientific investigations. In the principles of exegesis S. Thomas agrees with Augustine. To him it seems very unlikely that God imparted to Moses and other sacred writers truths that human reason can itself compass. Consequently, he says, not every possible sense is the sense intended and expressed by the author.[5] He draws a distinction between truths that belong directly and indirectly to faith. Those truths belong directly to faith which, if denied, entail something contrary to faith,

4 Amélinan, *Revue du Monde Catholique*, 1883, No. 112, p. 644.

5 *De Potentia*, 4, 1. *Summa Theol.* I., qu. 32, a I. See *Theol. Quartalschrift*, 1878, p. 3, seq. Albert, M. *De gener. an.* 3, 10. See Wolff, *Geschichte der Astronomie*, München, 1877, p. 42; Meyer, *Geschichte der Botanik*, n. 29.

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or some conclusion that endangers the immunity of Holy Scripture from error. A wide margin was allowed in interpretation, so long as men had not fully realized the consequences involved. S. Thomas ranges himself on the side of the Greeks, but he repeatedly and in so many words orders quarter to be given to Augustine's ideal explanation. The most distinguished commentators, Nicholas de Lyra and Raymond for instance, hold fast to the same principles. Peyrère, a great commentator on Genesis, is, on the whole, in alliance with Augustine. Augustine's influence was considerable till the star of Cajetan rose. Then Petavius steps forward, and with a brazen voice assures us that men in his day thought Augustine's theory was exploded, because the letter is dead against it.

The question was not hotly debated till the new world-system was first broached. This fact is as intelligible as it is significant. Astronomy set the natural science ball rolling. Not by mere speculation, but by dint of painstaking researches (imperfect, indeed, at the time), it attained a result which was in formal contradiction with the letter of Holy Scripture. It was natural, therefore, for theologians to be up in arms. Their appeal to the Fathers also was intelligible, as long as the bare fact and not principles formed the theme of discussion. For, as far as principles went, the Fathers voted solid for the Ptolemæan system. It is likewise significant that the opposition should have waxed stronger, simultaneously with the great awakening of scientific enquiry. Not much harm was done, while men merely took their intellects for an airing, and indulged on a holiday in a little guess-work about another system; but when the question assumed a bodily and tangible shape, the situation was altered. The Reformers, who stood by the letter of Holy Scripture, saw in the performances of Copernicus an attack on Holy Scripture, and they accordingly scouted him as an idiot. Catholics did not boil over with opposition to the new system till Galileo, by his discoveries in the heavens, also unsheathed his sword against the entire natural philosophy of Aristotle

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and the Schoolmen. It was Galileo, the contemporary of Kepler, who sought to make tradition the dividing line between theology, especially exegesis, and natural science. He appealed to the principles laid down by SS. Augustine and Thomas. He re-echoed the opinion of Augustine that Holy Scripture should take the lowest place in mathematical enquiries. No fact of nature, he contended, ascertained by experience or based on evident and necessary proof, ought to be questioned because it seems in conflict with passages of Holy Scripture, which contains thousands of words with different meanings. For the works of nature, unlike the words of Holy Scripture, are governed by fixed laws. Truth cannot contradict truth. Hence wise commentators should make it their business to extract the true meaning from Holy Scripture, and to bring it into harmony with the evident and certain conclusions of science. No mere *consensus* of the Fathers can avail here. For their interpretation has a theological value only in the supposition that the questions in point were then debated and argued on both sides. As this, however, was not the case, they had no reason to depart from the common literal opinion. Considering the times in which it was broached, this view was astonishingly bold, for it seemed to reverse the relations between science and the Bible. Consequently Galileo met with scant courtesy and favour from the theologians of the time. It was his misfortune that this difficult question was mooted in an age seething with turmoil and discontent. It was an additional misfortune that the question centred in a point about which profane science and theology, the letter and the traditional interpretation of Scripture were all but unanimous.[6] In a recently discovered letter (April 12th, 1615), addressed to the Carmelite monk Foscarini, Bellarmine thus writes : The Council of Trent forbids any interpretation that goes against the interpretation commonly

6 See *Theol. Quartal.*, 1877, p. 639, seq. Schanz, *Galileo Galilei*, Würzburg, 1878. Grisar, *Galileistudien*, Regensburg, 1882. On Kepler see : *Zeitschrift für Kath. Theol.*, 1887, p. 1, seq.

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agreed on by the Fathers. But not only Fathers but also modern commentators on Genesis, Psalms, Ecclesiasticus and Josue are agreed on the literal interpretation. Therefore the Church cannot tolerate the opinion of those who impute to Holy Scripture a meaning which is at variance with that assigned to it by the Fathers, and all the Greek and Latin commentators. The Council, indeed, mentions only objects of faith and morals. There are, however, doctrines *ex parte objecti* and *ex parte dicentis*. The world-system is one of the latter. To this Galileo retorted with force : it is not said "*in omni verbo Scripturarum sequenda est* "*expositio*," but "*in* REBUS *fidei et morum*." Hence the Council of Trent had in view only *res fidei et morum ratione objecti*. And, indeed, Bellarmine was forced to make this concession in theory. For Holy Scripture may be abandoned in deference to scientific results that are certain ; but a mere doubt is not a sufficient reason for abandoning the explanation of Holy Scripture given by the Fathers.*

In practice, however, he would hardly concede that it was possible for certain scientific results to contradict the letter of Holy Scripture ; still, as an hypothesis, it was an acknowledged principle that, in such cases, Holy Scripture was to be explained according to science. The distinction drawn by the Councils of Trent and the Vatican between matters that are and that are not of faith and morals would be meaningless and futile, did matters of faith and morals include everything that is contained in Holy Scripture. It is the shallowest sophistry to argue that the distinction is good in itself but no good to believers, because all things in Holy Scripture are God's word. But the question is precisely this : How is God's word to be interpreted ? God's Word is written in human language, and brought within the compass of man's rude powers. This is a point which demands the earnest attention of all interpreters. Let us take a parallel case from religious history.

* In other words, only those results of natural science which are undoubted and certain are a canon for interpreting Scripture. They alone justify a departure from the obvious, literal, and traditional meaning.—*Tr.*

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Buddha's earliest disciples called the founder of the Indian religion by the name of the All-knowing. Later on it became manifest that in many things Buddha had merely spoken after the manner of his contemporaries. When, for instance, it was seen that he shared the errors of his contemporaries in regard to the form of the earth and the revolution of the heavenly bodies, the Buddhists straightway limited his omniscience to the chief points of his teaching. He is now considered All-knowing in those points only which he knew by contemplation. His omniscience or infallibility is bounded by faith and morals. In the domain of sensible and intellectual knowledge it has no place.[7] In Holy Scripture the writer must be carefully distinguished from the inspiring spirit; the parallel applies to the writer only. Galileo's principles are correct, and are nowadays commonly accepted as such. The Church stands aside while the learned are disputing as to what is the boundary-line between the two provinces. The chief point is to determine which results of natural science are undoubted. Till this point is settled profane science cannot be allowed a higher office than that of a welcome handmaid to exegesis. But in any case the truths of faith must remain untouched. The human envelope and environment have no permanent value. As the Apostle says: "The letter killeth, but the spirit quickeneth." The words of the Lord are spirit and life. Only in this spirit can we search the deep things of Scripture. It is not a little remarkable that in modern times, especially in France and Italy, there have not been wanting learned men, such as Cuvier, Ampère, Moigno, Foville and Secchi, who see a proof of Moses' inspiration in the geological disclosures of the first chapter of Genesis; but the majority of learned men and theologians think decidedly otherwise. The narrative, howsoever it be explained, has certainly sketched the drama of creation in bold outline; but it may be questioned whether the several acts exactly correspond to the

7 Max Müller, *Vergleich. Rel. Wiss.*, p. 117.

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event. Perhaps this discussion of the principles of exegesis may seem somewhat out of place. It will, however, serve as a solid foundation on which to build our interpretation, and it will, moreover, set limits to our enquiry. We have now to pass in review the literal interpretation, the restitution hypothesis, the concordant and the ideal theories.

The discovery of petrified animals and plants in mountain strata made learned and unlearned rub their eyes and gape with wonder. Some thought they were freaks of nature (*lusus naturæ*), others saw in them a confirmation of the biblical story of the deluge. Stones either entirely scooped out by the water, or lying in juxtaposition with shell-animals, if found on the mountains at a distance from the sea, were held by mediæval scientists to constitute a proof of the great Noachian deluge.[8] Neither of these theories will hold water. The freak-of-nature hypothesis is non-suited because petrified remains are found in countless numbers. The deluge, again, did not last long enough to cause the gradual succession described in a previous chapter. Petavius insisted that there would never have been any doubt about the six days, if men had walked in the simple laws of thought instead of running after an ingenious theory. He urged this as an argument against simultaneous creation. Philosophic reasons, like words written in water, quickly fade; but scientific reasons unfailingly produce an impression that lasts, as words engraven on brass. Now a change has come o'er the scene. To expend words in discussing the deluge-theory or in explaining the six days literally were nothing but to waste night, day, and time. A few authors there are, Keil, Veith, Laurent, Bosizio, Oeti y Lara, stranded on a desert island, who still cling to the old theory either in defiance or in ignorance of facts. Sea and fresh-water formations alternate in every direction. The many and various petrified remains, firmly imbedded in the rocks, are separated

8 Fellner, *Compendium der Naturwissenschaften an der Schule von Fulda im 9. Jahrhundert*. Berlin, 1879, p. 21.

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from one another by thousands of yards. Any man seeking to account for all these phenomena by a single deluge, which lasted barely a year, can hardly expect to be taken seriously. To take refuge behind God's almighty power, as if God created the imbedded strata from the beginning, is to substitute a *lusus Dei* for a *lusus naturæ*. As a sneer at science it is tolerable, but as a serious hypothesis we may, without further ado, unceremoniously relegate it to the shades,—a fate it richly deserves. Sound theologians will resent such a caricature of theology as eagerly as geologists will administer a well-merited snub. The theory which maintains that God completed creation in six days of twenty-four hours, is wrecked on every reef and rock of geology and palæontology.

The *Restitution* hypothesis seeks to retain the literal explanation without incurring its condemnation. It assumes that the petrefactions belong to an earlier creation, which was destroyed consequently on the fall of angels. There is a pause between the first and second verses of *Genesis II.* to denote the catastrophe. The Talmud so far favours the theory as to interpret "the earth" in verse 1 to mean the earth in a finished state. Here then there is no *Tohu Va Bohu*. Between the two intervenes a great gap which has to be filled in, among other things, by the fall of the angels. But exegesis, dogma, and science concur in pronouncing the theory untenable. Exegesis shows that the words "heaven" and "earth" in verse 1 mean the whole undigested and unformed lump, that was merely the foundation of all the individual creations that follow. Perhaps, however, this verse may be considered the heading of the whole narrative. It would be impossible to indicate better the original nebula of the Kant-Laplace theory. Again, verse 2 says not that the earth was becoming, but that it was chaos. In the following verses this chaos seems quite naturally to be differentiated. Dogma has its own reasons for denying that the fall of the angels exercised the alleged influence on the development of creation. Moses lets fall no hint to this effect. The spiritual nature of the angels

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tells against it. Thus this hypothesis makes a wholly unwarrantable assumption at the outset. No eye not blinded by looking through a philosophical camera obscura, or jaundiced by unhealthy theological assumptions, could possibly see in verse 2 the outcome of a struggle between spirit and nature. If creation results from the finite opposition between spirit and matter, if natural phenomena are but the development of matter, and if this development is due to the disturbing effect which the fall of the angels produced on creation,[9] what would follow? We must ascribe to the Bible the doctrine that the fall of the angels thwarted the all-wise Creator's plan. We must, moreover, request science to confess that the irrational world is nothing more than a caricature. But scientific men will never allow that "the disturbance in the equilibrium of matter on which phenomena rest" can only be made intelligible, by supposing that the equilibrium was disturbed by the conflict between spirit and matter, in other words by original sin, that is, by the fall of the spirit. It is not at all easy to see what good will accrue to theology from this hypothesis, unless we are prepared to grant that the spiritual and material world were derived from one and the same principle, and differentiated in this particular manner. Then the specific distinction between the two would be wiped out. Then the flood-gates are opened, and the waters of Monism rush in. The Schoolmen, the Aristotelian distinction notwithstanding, were right in assuming from verse 1, not that the two worlds, but that the matter of heaven and earth was one. In the next place, what would geology gain by the hypothesis? For this prior creation it would require the whole succession of organisms and cataclysms about which the Bible is silent. Will the restitutionist account for the silence by saying that there was no reason for mentioning former creations and destructions? Then how comes it that they agree so remarkably with the narrative of the Hexæmeron? How

9 Michelis, *Das Gesammtergebniss der Naturforschung*. Freiburg, 1885, p. 68.

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was such excellent order preserved in that great catastrophe? The whole hypothesis is made up of factors that are both unknown and hard to conceive, and thus it lies outside the pale of probability. Among its advocates may be named Chalmers, Buckland, Wiseman, Hengstenberg, Kurtz, Schubert, A. Wagner, Keerl, Westermaier, Michelis, Vosen, and (in part) Scheeben. It should be noted that these men belong for the most part to the pre-Darwinian period.

Day is first mentioned in verse 5. Thus the time allowed for what precedes is not measured. The progression from the original nebula to light is explained by the movement and contraction of the great masses. From verse 2 onwards, the writer has the earth solely in view. Light reached the earth when the rays from the central mass penetrated the surrounding vapour, which enveloped all things in darkness. The earth, when separated from the central body, began itself to rotate. But there was no palpable distinction between light and darkness till after the intervening vapour had been scattered. From this dispersion we date day and night. Thus far the Bible and science are in perfect harmony. For the wider meaning given to God's creative word will surely be a stumbling-block to no believer. Light does not cease to be a creation of God because it was gradually formed, or because we no longer attach to the easy-flowing Scripture narrative the meaning that God suddenly lit up the solar system as a man hangs a lamp in a room. Light causes motion and life. It is the most indispensable and beneficial factor in all being. The moment that light first appeared on the earth is surely, then, the most fitting time to introduce the words: "And God saw the light that it was good." Chaos and differentiating light form a majestic introduction to the particular accounts in the narrative. The superficial student will, on first thoughts, be inclined to think it would have been more natural if the earth had been first created as it now is. Greek and Eastern philosophers tried to show how the earth developed from matter, or

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from an absolute, and invested light and fire with considerable influence. But when a simple explanation is given of a deep truth, men stand rapt in wonder.

From this point onwards, adjustment becomes more difficult. Only two alternatives remain: to regard *days* as general designations of time, or as the symbol of an idea. The *concordistic* theory chooses the former alternative. From it we shall gain a good idea how far we can stand by a grammatical and historical interpretation. Every unbiassed reader will, in the first instance, give the word *day* (*yom*) its ordinary meaning, and treat the narrative as historical. Probably the sacred writer also shared this opinion or, at all events, intended to convey that impression.[10] Thus only could he fulfil his purpose of modelling the Jewish week and Sabbath on creation and God's rest. Nevertheless he did not slam the door in the face of all our scientific interpretations. Exegetically, *yom* may mean day as opposed to night, or day and night together, or even time in general. Thus in Isaias* the word stands for the time at which an oracle is fulfilled. It is also often used in adverbial phrases for: at this time; at that time; from the time, &c.† Time in general, time of life, and years are still more frequently expressed by the plural. Moreover, it should be borne in mind that we are here discussing an action of God that cannot fall in time. The Apostle echoes the Psalmist's words:§ "With God a thousand years are as one day;" meaning that God's works are not to be measured by time. God required no time whatever for creation. Hence the expressions used chiefly for our sake in Scripture should, with all the more reason, be applied not to creation, but to the formation of things, for which length of time was required. In like manner we learn from the cuneiform inscriptions that there was a long interval between the births of the different gods. If these parts of the narrative are analogous to those other parts

10 Petavius, Præf. de opit.
* xlviii. 7.
† Gen. ii. 4, 7.
§ Ps. xc. 4; II. Pet. iii. 8.

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which indicate the intervals that elapsed between the production of the various creatures, we shall have to hand further confirmatory evidence that *yom* may signify a period.[11] According to the Parsee Zend-Avesta, the world was created in six periods, and each period lasted a year.[12] There need, therefore, be no hesitation in giving to the word *yom* this extended signification. Exegesis has no objection to lodge except, perhaps, the phrase: "It was evening and morning, one day." But this phrase was used to meet the exigencies of the narrative. It was necessary to indicate the alternations of day and night, in order that the several works of each day in a typical week might appear complete. It was intended to set a limit to the works of creation that follow, not to sanction the Jewish custom of beginning the day with the evening. For this custom, by the way, was of no avail except in the ecclesiastical year. S. Augustine interpreted evening and morning as referring to the knowledge of the angels, i.e., their knowledge of things in God and in reality. This figurative interpretation is as far-fetched as Abelard's decree and execution; but his other idea is sublime, in which he explains morning and evening as *transitus ab informitate ad speciem*. Thus there is no reason for excluding this phrase from the form of the narrative. We may, therefore, understand by the *day* an indefinitely long period. Now, however, the difficulty comes from another quarter. If the long period of development is accounted for in this way, it has to be still further considered whether the successive order of works on the six days corresponds to the periods of geology and palæontology.

The *second* day's work, the division of the waters by a firmament in the middle of the waters, is not properly a creation but only a continuation of the process already at work on the earth. Hence the words are not added: "God saw that it was good." By the waters some understand the clouds above. Secchi ingeniously interprets

11 Vigouroux, *Die Bibel*, I., p. 177.
12 Max Müller, *Essays*, Vol. I., p. 145.

them to mean the hydrogen which the spectrum analysis has proved to exist in the stars. In either case we are confronted with the result of a physical process.

The *third* day is divided into two parts. In the first, one process of development, viz. the separation of the dry land from the sea, was completed. The earth was now ready to receive organic beings. Both land and water were in a fit state to be beautified. Here it is again said: "And God saw that it was good." And forthwith yet another creation is related on that day: "Let the earth "bring forth the green herb, and such as may seed, and "the fruit-tree yielding fruit after its kind, which may "have seed in itself upon the earth. And it was so done. "And the earth brought forth the green herb. . . . "And God saw that it was good." Here the sacred writer, following the natural order, proceeds from the general to the particular, from the imperfect to the more perfect. Having recounted how the earth had been differentiated into land and water, he now mentions for the first time the earth's vesture, the plants, which are in part one with the earth, and thus, as it were, hold a middle place between the organic and the inorganic worlds. The earth also supplies the animal world with matter for its organization. In verses 29 and 30 special reference is made to this function of the vegetable world. It does not, however, thence follow that all animals were originally graminivorous. For it is proved beyond a doubt by palæontology and anatomy, that beasts of prey existed long before man stepped on the scene. But these verses merely indicate the fundamental relations that subsist between the two kingdoms. Directly or indirectly, the animal is dependent on the vegetable kingdom.

Details, however, are not so clear. The creation of plants, that is the entire flora, is here narrated, once for all. The oft-repeated phrase, "according to its kind," though certainly not to be taken as a technical term of botany, denotes, nevertheless, that the several kinds of plants have a specific character. From Petrography we

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learned that animals and plants appeared on the earth's surface at the same time, and by slow degrees. In the higher forms this is always the case, although the two kingdoms do not march in strictly parallel lines. It may be granted that the more delicate plants perished more easily in the formation of the strata. Allowance must also be made for disturbances in the geological epochs. The presence of the same kind of plants and animals in two similar strata, in places far removed from one another, does not prove conclusively that the strata were formed simultaneously. It is not an easy task to determine the age of the so-called "leading fossils" in the several strata, or to mark them off clearly from those above and below. Animals and plants can be propagated only by degrees. In different places the formations to which they belong also differ.[13] These, however, are minor details that hardly touch the main question. The territory, as a whole, is definite enough, although the exact boundary-line cannot always be drawn. The sea, which offered fewer obstacles to formation and propagation, was the home of the first organisms. Regular layers may determine the irregular. This is by no means moving in a circle. Palæontology and petrography have given a substantially accurate account of the beginning and progress of the organic kingdoms. The business of exegesis is to try and reconcile the two accounts. As the sacred writer set out from the flora then in existence, and merely intended to note the fact of creation, his interpreters may reasonably suppose that his story takes in the whole flora, which then began to be gradually differentiated. He says: "Let the earth bring forth." This expression, derived from the development of individual plants, is put for the development of the whole family. But this development may have stretched over and lasted through the periods that follow.

This somewhat free construction put upon the words does not, however, give well-defined periods, in the geo-

13 See *Natur und Offenb.*, 1885, p. 125. Secchi, *Schöpfung*, p. 20.

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logical sense of the term. By a period geologists understand the time necessary for the formation of several groups, e.g., the azoic, palæozoic, mesozoic and cainozoic periods. The subsequent creation of animals enhances the difficulty. No mention of animals occurs before the fifth and sixth days. And yet animals and plants entered on the scene at the same time! The fourth day has nothing to do with the question in hand. The work of the fifth day extends from the beginning of the third day till beyond the fifth day. Another beginning must, therefore, be assigned to it. What remains then of the geological period of animal creation? or of its several periods? Perhaps some one will say that Moses merely intended to give a rough sketch, or broad outline of creation. This conjecture, however, affords only an apparent outlet to the difficulty. If we ascribe the simultaneous appearance of plants and animals to the smaller power of resistance possessed by the plants, we are not entitled to execute a change of front and use the same argument (*argumentum ex silentio*) to prove the existence of immense numbers of plants before the animal creation. Palæontology proves the contrary. Countless animals (trilobites) swarmed in the sea before the luxuriant flora of the carboniferous period had appeared. At first blush it would seem more plausible to argue with Reusch, Vosen and Rheinstädter that the first plants only were created on the third day, the first animals of the air and sea on the fifth, and the first land animals on the sixth. On closer examination, this rendering seems to do violence to the text, without satisfying the claims of petrography; for it expressly makes animals and plants begin at times far apart. Periods complete and definite seem to elude the grasp of the Concordantist, and to melt in his hands. All he can lay hold of is a bare outline or a logical skeleton.

The fourth day looks like a most awkward intrusion between the plant and animal creations. If it be regarded as a period by itself, the two creations are separated by a great interval, and the third and fifth days cannot possibly

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overlap. Unless the word day be here taken to mean a period, the principle on which the explanation rests cannot hold. This is a difficulty for the concordistic theory only. But the fourth day forges yet another difficulty, which occasioned much head-racking to the men of old. Three days had passed by since the creation of light, when lo! on the fourth day, sun, moon and stars are said to be created for the purpose of dividing the day and the night, and of being for signs, and for seasons, and for days and years. The original light is explained to be a mass of light, confused and general. Before the sun was created, the extension and contraction of this mass is said to have regulated the alternations of day and night. It is more correctly argued that the days preceding the fourth day, on which the sun is first mentioned, are not to be computed astronomically. Day and night are necessary for higher animal life which alternates between sleeping and waking. Higher plants also require the change of year, as shown by their rings which chronicle the years. Neither, however, can the author have intended the days that follow to be taken as astronomical days. This further conclusion has slipped out of sight. For the "period theory" the whole explanation is meaningless.

Does the fourth day, however, treat of the creation of the heavenly bodies? or merely of their relation to the earth? May it not be urged that the narrative radiates from the geocentric standpoint? and that the heavenly bodies are being viewed solely under this aspect? The chief point lies in the arrangement of the heavenly bodies. The words that follow will strictly bear this explanation. "Let there be light made in the firmament of heaven. ". . . . And God made two great lights. . . . "And he set them in the firmament of heaven to shine "upon the earth." Furthermore it has even been thought that this interpretation brings the Bible into harmony with the Kant-Laplace theory. The light on the first day was the light of the central mass, which was gradually differentiating into the respective heavenly bodies, until the

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solar systems were formed. Meanwhile the dense atmosphere of the earth may have shut out the sunlight. But as the sun's mass became more and more concentrated, the light was gradually diffused. Light, too, was less necessary. The older cryptogamic vegetation needed less light. A luxuriant carboniferous vegetation thrived in an atmosphere impregnated with carbonic acid. The trunks that have been discovered exhibit a colossal growth, but no annual rings. Respirative animals are rare. Everywhere there is luxuriance and strength rather than variety. The high temperature was favourable to this result. Warmth, heat and shade are the efficient factors in pre-solar vegetation. The insects are mostly night-insects. The eyes of trilobites show that light was wanting. Theodoret's solution is still more simple.* Plants, he says, were created before the sun because, not having eyes, they need no light. Moses, say the Fathers, delayed naming the stars till the fourth day on purpose to deal a blow at sun-worship. This explanation only proves that they thought it preposterous to saddle Moses with such ideas as to the significance of light.[14] There is no need for modern commentators to lay so much stress on this religious point of view, since science has abundantly proved that light existed before the sun. We will not here enquire whether this furnishes a proof of Moses' inspiration , but we must confess that, in great part, it meets the objections raised by Bishop Clifford, who finds the chief argument against the concordistic theory in the fourth day. The theory, however, is not thereby justified, because the "period," so far as it concerns the fourth day, is thus abandoned. Simply the gradual result of the development is given or indicated. Thus the relation of the stars to the earth was not finally fixed. We lay stress, not on this circumstance, but on the fact that their development ran parallel with the first three days. Apart from the

* *Gen.*, Q. 14.

14 Theophilus, *Ad Autolycum*, 2, 15. Origen and others. See *Controverse*, 1862, p. 753, seq.

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religious purpose, viz. the divine Sabbath week, we see no cogent reason for mentioning here this particular relation of the heavenly bodies to the earth.

The two following days offer no special difficulty. It should be noticed that, as already remarked, the word *barâ* is used in verse 21 for the creation of the great sea-animals, whereas *Asâh* stands in verse 25 for the creation of the land-animals. In both instances the narrative relates the fulfilment of the order God gave to the elements to bring forth living beings. In the main, too, the succession tallies with that set forth by natural history. Nowhere, however, is there a question of complete creations.

If the period-theory be abandoned, and the works of the several days be regarded as so many divine acts to which special prominence is given, in order to emphasize the fact that all things without exception were created, and in order to set an example for religious life, there need be no hesitation in admitting a *successive* creation. The metaphysical reasons brought forward by Augustine and his followers, and the modern reasons drawn from natural history are alike insufficient to do away with succession. Augustine found himself unable to adhere strictly to simultaneous creation. In the different periods he allowed a temporal development springing from the forces and germs that the Creator had instilled in created things. He brushes aside the ordinary explanation; but, without doing violence to the text, he cannot refuse to admit that successive formations were spontaneously produced by the laws of nature, in intervals longer than twenty-four hours in duration. He feels himself constrained to leave scope for development. The eternal ideas, realized in creation, constitute so many interferences in nature on the part of the Creator; but they are also the types regulating all subsequent information of matter, which takes place without any immediate interposition of God. Thus S. Thomas adopted Plato's theory as amended by S. Augustine, and strove to bring it into harmony with Aristotle. The Scotists, indeed, thought S. Thomas was somewhat

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tainted with Nominalism. The Thomists, in turn, reproached the Scotists with being steeped in Platonic errors. Some modern Catholic savants, discarding all further action on the part of God, hold that development is due to the power of variation with which the original germs were endowed. Other scientific men explain development by a transformation effected by God in the ovules. Thus God's interference is, in principle, conceded. It is not easy to see how nature, which is actually successive in its manifestations, is to be understood without successive acts of creation. These acts, however, must not be considered temporal in their cause, but only in their effect.

The further this train of thought is pursued, the greater grows the difficulty of taking our stand on the concordistic theory. All else has vanished, save the one fact that God created in a series of progressive acts. These acts, however, did not follow one another in unbroken succession, nor (except in a general way) in periodic days. In the supposition that creation was successive, Moses based his division on an ideal and religious principle. The creations, as they lie before him in their completeness, are his starting-point. While wishing to set forth the beginning and origin of things, he contrives to make God appear ever afterwards as being absolutely at rest *ad extra*. Thus Moses embodies in his narrative a religious idea which originated perhaps in a vision vouchsafed to him or to Adam, as is contended by *Kosmos Indikopleustes*, Vosen, Scheeben, Martin, Molais, Hummelauer and Schäfer.[15] Lately the ideal theory has gained a widespread acceptance. At first blush it may seem to stand in glaring contradiction to the words. An historical narrative robed in a religious idea may excite surprise. Nevertheless it is quite certain that ancient writers generally, and above all Semitic writers, judged the historian's task by a different standard from that now in vogue. The sacred writers are very free in their treatment of profane subjects.[16] Being,

15 *Controverse*, 1883, p. 154.
16 See Schäfer, *Bibel und Wissenschaft*.

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moreover, Semites, they were accustomed to see abstract ideas take a concrete shape. Again, the ideal theory alone can fix accurately the limits of theology and natural science. While admitting an analogy with historical development, it requires no agreement in detail. Content to uphold a divine cause in the whole and in the main, it hands the earth over to the discussions of the learned. S. Augustine's theory, says S. Thomas, is more sublime, and better calculated to defend Scripture against scoffing unbelievers, but the explanation of the other Fathers is clearer and more conformed to the letter. Neither, however, contradicts the truth of faith.[17]

For this very reason, however, it behooves the defenders of the idealistic theory to bring out in strong relief the idea and purpose underlying the Mosaic narrative. In regard to the main purpose, the matter is so clear that but few words are needed. In the most solemn and impressive manner, Moses weighs the almighty creative power of God in the balance against heathen myths. He wishes to bring home to the Jews the great contrast that obtains between the creation of *all* things by *one* God to whom alone worship is due, and the worship of nature and of idols made by human hands. Beginning, therefore, with the creation of all things, he gradually proceeds to the creation of the various kingdoms. But God's creation also must be copied from the divine idea. God's activity must be the type on which human activity is formed. The end for which the earth and all things therein are created is to unite man to his Creator, and to lead him to eternal salvation. What, then, could be more natural than to sketch a religious week modelled on the divine week of creation, and thus inflame man with zeal for the faith and stimulate him to live religiously?

Bishop Clifford construes the first chapter of Genesis (which he thinks but loosely connected with the historical narrative), as a *religious hymn*, composed by Moses for the

17 *De Potent.*, 4, 2.

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purpose of destroying idolatry root and branch. The bishop gives point to this theory by observing that among the Egyptians the days of the week were dedicated to the planets, and the days of the month to different gods. This he considered the hinge on which Egyptian idolatry turned. This new modification of the ideal theory has met with considerable opposition. Nevertheless it has gained greater prominence and increased appreciation for the poetic element in this sacred poem. It seems, indeed, a noble introduction to the story of God's dealings with the human race, and a spirited picture of the scene that God was preparing for man's activity. But the proof for the number *six* is not yet forthcoming. Heretofore no success has waited on the attempt to prove the existence of such a cultus among the Egyptians. Even if the Egyptians were acquainted with the seven planets, it is still an open question whether their week had generally seven days. Dion Cassius traces this division of the week to an Egyptian source; rather it was discovered by the Jews or Babylonians. According to the cuneiform inscriptions, the Assyrians observed the Sabbath as a day of rest.[18] The Chaldeans reputed it an unlucky day, but held it sacred to God. They consecrated every day of the month to some god or other. We are still, however, as far as ever from understanding the work of the six days: for such an institution merely necessitates a leap from the week to the month. The only religious ideas left are Monotheism and the Sabbath, which latter is supposed to be connected in some way with the worship of the stars.

Perhaps the famous fourth day may supply the clue to the division. In Genesis ii. 1 it is said: "So the heavens "and the earth were finished, and all the furniture of "them." From this passage the Fathers have concluded that the stars are the furniture of heaven, and the plants and animals the furniture of the earth, sea and air.[19] Ac-

18 Vigouroux, p. 181. See Amos v. 26. Reuss, *Geschichte der heil. Schriften des A. T.* 1881, p. 81.

19 Juvilius, *Instit.*, 2, 2. See Kihn, *Theodor von Mopsuestia*, Freiburg, 1880, p. 496.

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cordingly Peter Lombard, an authority with all Schoolmen, drew a distinction between *creatio*, *distinctio* and *ornatus*. *Creatio* is antecedent to the work of the six days. The *distinctio* was the work of the first three days, in which the light was separated from darkness, the lower waters from the higher, and the dry land from the water. Here we see the distinction into the four elements: light, air, earth and water. The three following days are devoted to furnishing or *adorning* the elements. On the fourth day the earth was adorned with sun, moon and stars; on the fifth day the air was adorned with birds, and the water with fishes and sea-animals; on the sixth day, the earth was adorned with land animals. The ornaments of heaven are mentioned first, because the species of the other elements, and in part of light and heat, is determined by heaven. SS. Thomas, Bonaventure and others lay stress on the movement of which the adornment of the several elements is made up. Hence the creation of moving things, both in heaven and on earth, belongs to the *opus ornatus*. This gives a hint as to how the third day is to be explained. The creation of plants on the third day, which is apparently out of place, indicates that these organisms occupy a middle place. They have no voluntary motion, but their roots are fixed in the earth whose garment they are. Cicero sings the praises of the round solid earth, placed in the centre of the universe, and clad with herbs and flowers, trees and fruit. To the Copernican the stars are not the furniture of heaven. For that which we call heaven is in reality non-existent, and its movement is in great measure merely apparent. The formation and adornment of the heavenly bodies must have been gradual. Hence the two triplets of days that go to make up the *distinctio* and *ornatus* are not to be separated in time, but should be conceived as parallel. Thus the first and fourth days run in parallel lines, inasmuch as light, the property common to all heaven, is now said to be diffused from the several illuminating bodies, after their separation from the primitive nebula. So the common luminous matter may

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be said to have been differentiated on the fourth day. And all differentiation serves the purpose of ornament. In like manner the second and fifth days, and the third and sixth are pervaded by a similar parallelism. So, at a stretch, it may be said that the earth's elements were differentiated in the old sense. But it is preferable and more exact to say that the elements were peopled by concrete living inhabitants, which feed in and on them. The Cosmos (*mundus*), as it is called, is perfectly formed only when the elements are differentiated and animated. Hence the principle of division, though æsthetic and religious, is not unnatural. Though ethical it is not in reality arbitrary. It harmonizes, moreover, with the course of creation. Creation culminates in the creation of man. One feels tempted to survey the whole creation from this point of view, and to say that Moses' set purpose was to depict the earth as the dwelling-place prepared for man.[20] The dark mass was first lit up. Then the house was roofed in; a concrete floor was laid, and carpeted with plants. Next came the actual lighting-up, then the servants, and lastly the lordly tenant. The lights are necessary from the first. The lighting of the mass will not account for day and night before the fourth day. This fourth day is proof against all other explanations.

20 Scheeben, *Dogmatik*, vol. ii., p. 100.

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CHAPTER XVI.

THE SYSTEM OF THE UNIVERSE.

Although Genesis makes no express declaration in regard to the system of the universe, it evidently takes the geocentric system for granted. The earth and man appear as the centre and end of creation. The same supposition also underlies other parts of Holy Scripture: "He "hath set his tabernacle in the sun: and he as a bride-"groom coming out of his bride chamber hath rejoiced as "a giant to run the way: His going out is from the end "of heaven, and his circuit even to the end thereof."* "Who hast founded the earth on its own bases; it shall "not be moved for ever and ever."† "Who shaketh the "earth out of her place, and the pillars thereof tremble. "Who commandeth the sun and it riseth not."‡ "One "generation passeth away and another generation com-"eth; but the earth standeth for ever. The sun riseth and "goeth down, and returneth to his place; and there rising "again, maketh his round by the south, and turneth again "to the north."‖ This language would not be out of place in the mouth of a nineteenth-century poet. The *ordinary mode of expression* has remained ever the same. It rises to the lips of learned and unlearned alike. We cannot easily break through the entrenchments with which phenomena have circumvented our views and ideas. Nevertheless

* Ps. xviii. 6, 7.

† Ps. ciii. 5. See Ps. xcii. 5 and xcv. 10.

‡ Job ix. 6, 7.

‖ Eccles. i. 4–6. See Proverbs viii. 29.

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these express allusions to the immovable foundations of the earth argue more than a mere adaptation to current ideas. The more the firm stability of the earth is contrasted with the moving heavens, the stronger grow the reasons for believing that the sacred writers were inwardly convinced that the heavens move and the earth stands still.

This last point is brought out still more clearly in Josue x., 12 and IV. Kings xx., 11, "Then Josue spoke to the "Lord, in the day that He delivered the Amorrhite in the "sight of the children of Israel, and he said before them : "Move not, O Sun, towards Gabaon, nor thou, O Moon, "towards the valley of Ajalon. And the sun and the moon "stood still till the people revenged themselves of their "enemies. . . . So the sun stood still in the midst of "heaven, and hasted not to go down the space of one day." Isaias gave the sick king Ezechias a sign from God. "And "Isaias the prophet called upon the Lord, and he brought "the shadow ten degrees backwards by the line, by which "it had already gone down in the dial of Achaz." Here a distinction may be drawn between the fact itself and the mode of expression, which is accommodated to our mode of perception ; but the distinction would be a little far-fetched. Doubtless it would be silly to expect of the chronicler a scientific statement from the Copernican standpoint. To his readers such a statement would have been as bewildering as an unknown tongue. And yet we cannot shake off the thought that the narrative is pervaded by a conviction that the Ptolemaic system is true. So much may be granted without detriment to inspiration, for there is here no question of a matter of faith.* Faith comes

* To say that a physical theory of the system of the universe, which really underlies the words of Scripture, may be false and not inspired, because it is not of faith, is clearly to beg the question. We have no means of deciding whether a thing is inspired or not beyond the fact of its being contained in Scripture. Moreover, as S. Thomas explains, whatever is contained in Scripture is an object of faith either *per se* or *per accidens*. It would be better, therefore, if the author had stated the case thus: The Ptolemaic system commonly prevailed, and was borne out by appearances; the sacred writer may also have been privately convinced of its truth. Nevertheless the Holy Spirit, who inspired the sacred writer, borrowed from him merely the *modus loquendi*. as being admirably adapted to the main purpose. In this way it may be safely affirmed that no approbation or sanction thereby attaches to the theory itself. Thus

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into play only in the last two passages, and then only in reference to a miracle wrought by divine power. The miracle remains whichever system, the Ptolemaic or Copernican, is taken as the foundation. In neither case is it necessary to contend that God interfered with the movements of the sun and moon. It is sufficient for the purpose, as Kepler holds, to have produced this impression on the parties concerned; and assuredly such an effect could not be other than miraculous. In olden times these passages were considered a proof of the Ptolemaic system. Hence the tenacity with which later theologians, taking their stand on the Bible, clung to the Ptolemaic system; hence, too, the conflict which we now proceed to sketch.

In all ages there have been men who, in the teeth of appearances, have essayed other theories in explanation of the world's motion; but they were few and far apart, and their speculations were unnoticed. But as their physical explanations were exceedingly faulty, and as their arguments were merely philosophic and not astronomical, they were utterly unable to overthrow a system that, to all appearances, was solidly built on mathematics and astronomy. The Ionic School held that the earth's disc floats on the surface of the water. This naïve notion the older Pythagoreans repudiated. With Pythagoras they taught that the earth is a sphere moving freely in the centre of the world, and against Pythagoras they also taught that it revolves on its own axis. According to the received interpretation of the *Timæus*, Plato explained the earth's diurnal motion; perhaps he also stood on the brink of the heliocentric system. Aristarchus of Samos (280 B.C.) championed a twofold motion, diurnal and annual. Though assailed on every side he boldly stood his ground. Heracleides of Pontus (about 330 B.C.) had taken up the same position. Nor were these opinions unknown to Cicero and later writers. A central position is mentioned by Mar-

we may say with truth that the false theory held by the sacred writer is no hindrance to inspiration, not because it is not an object of faith, but because it is no part of the inspired writings.—*Tr.*

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cianus Capella as having a place in the Egyptian system. According to this system the earth indeed rests in the centre of the universe, but the inner planets, Mercury and Venus, are made to revolve round the sun. It seems open to question whether this system was ever really broached. It may have originated in misunderstandings. Copernicus, however, was aware of its existence. Tycho Brahe, on biblical grounds, sought to use such a system as a helm wherewith to steer a middle course between Ptolemy and Copernicus. Hipparchus (160–125 B.C.), one of the greatest of ancient astronomers, did not make bold to set up a system of his own. Ptolemy (125 A.D.), having completed the observations made by Hipparchus, utilized them to build up a system that should be in accord with astronomical requirements. Setting aside the Egyptian system, and philosophic views relative to the earth's motion, he declared in favour of a system based on the movement that the heavenly bodies appear to have. In the state of astronomy at that time this was the only theory that had a chance of success. In his view the earth is the immovable centre of the universe; the stars are set in motion by a *primum mobile;* and, on a lower scale, this motion round the earth is communicated to the planets. The eccentric circle of the epicycle was adduced to explain the complex movement of the planets. But Ptolemy was well aware that his system did not rank higher than an hypothesis. In answer to those who urged that his system must be wrong because it was complicated, he pointedly asked whether all the movements of the earth are simple. The preference should be given to simple motions; if, however, they do not serve the purpose, it is allowable to seek other solutions more in accord with observed phenomena. For thirteen centuries Ptolemy's system reigned supreme. The Arabs, indeed, made more correct observations and more accurate measurements, but even they deemed the system impregnable. To keep pace with accurate observations modifications were introduced; and in those days astronomers were as liberal with cycles and

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epicycles, as modern geologists are with the thousands of years they allow for the formation of the earth's crust. In consequence of this astronomical prodigality, the courses of the planets become in time so complicated that Alfonso of Castille (d. 1284) declared that, had he been consulted, he could have furnished the Almighty with a better design for the construction of the world.

For the rest it is not likely that Ptolemy and his school intended to endow the several heavenly cycles with a real existence. All they required was a geometric explanation of the phenomena of the heavens. Men cared little as to how the machinery of epicyclic motions was set going. Again, the Pythagoreans were alone in hitting the truth. For, according to them, the heavenly bodies trace out their courses by their own inherent force. The Physicists, whose horizon is for the most part bounded by experiment and observation, essayed a different explanation. The Ionians had a predilection for crystal spheres. According to Plato the planets resolve themselves into eight fixed spheres, whose axis passes through the earth. Plato's disciple, Eudoxus, basing his calculations chiefly on the inequalities of planetary motion, assumed that every planet has three or four homocentric spheres; but these had probably no place outside mathematical formulæ. Calippus added seven to the twenty-seven spheres of Eudoxus. Aristotle described the sphere-system as machinery. The earth is in the centre of a series of spheres or homocentric circles, which include the sun and the planets. These are set in motion by spirits, and move round the earth. The stars are firmly fixed in a vault that moves round the earth independently of the other planets. In this form Ptolemy's modified conception of the firmament as a series of nine or ten crystal spheres forms the main feature of all mediæval cosmogony. At first Aristotle's influence was at low-water mark; but since the 12th century it has assumed the volume of a cascade. Christian thinkers had drunk so deeply of this view that, as in other matters, they supposed it to have been derived from the Old Testament. Am-

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brose,[1] for instance, thinks that the philosophers copied David (Ps. cxlviii.), when they introduced in the place of sun and moon and five stars a harmony of spheres (*globi*) to whose cycles or rather spheres various movements were ascribed. This, in his opinion, is the origin of that harmony of spheres of which David speaks in the Psalm: *Laudate Dominum de cælis; Laudate eum sol et luna*, &c. On this point, as well as in Aristotelian philosophy generally, the Arabs forestalled the natural philosophy of the Middle Ages. Nine spheres, four elements, and four fundamental forces formed the basis of Arabian ideas on the Cosmos. Hence it is not surprising that, in the hey-day of Scholasticism, the Aristotelian theory of spheres was everywhere in the ascendant. To the physicist, a heavenly body freely revolving in space was as unthinkable as circular motion without a moving substance. To his thinking the stars revolved and were firmly fixed in material spheres. Aristotle's nine spheres formed the groundwork of Sacro Bosco's (1220) text-book, which was for centuries, even long after Copernicus, the standard work on astronomy. The earth lies in the centre of the world; around the earth is water; the water is surrounded by air; and the atmosphere as far as the moon's orbit is encompassed with fire. The spheres possess a twofold motion: the motion from East to West, which is that of the firmament around its axis, and that of the lower spheres, which move round the poles, and are distant from them about 23°, 33′. Even the great reformers of astronomy, Peurbach and Regiomontanus, found this theory indispensable, but they tried to simplify planetary motion to some extent by making the spheres hollow. Long after the 16th century, professors of mathematics like Mästlin, Reinhold, Wursteisen, Castelli and others were committed to this system in public, although in private they may have been disciples of Copernicus.

It was hard to swim against the stream, nevertheless dis-

1 *Hexameron*, II., 2, 6. Zoeckler, *Geschichte der Beziehungen*, I., 121-160, 173, 209.

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tinguished thinkers, dissatisfied with the system, were never wholly wanting. The embers of Pythagorean influence were still smouldering, although it was long before they were fanned into a flame. Albertus Magnus swelled the chorus of Aristotelians who blamed the Pythagoreans and Italian philosophers for teaching the motion of the earth, when appearances were dead against it.[2] Mayhap the memory of the Pythagoreans had not died out in Southern Italy. Perhaps, too, this supplies a clue to the fact that enthusiasm for the new system was first evoked in Italy. Even Aristotelians, however, were swayed to and fro when passing judgment on the certain teaching of astronomy. For S. Thomas[3] says that the hypothesis framed by astronomers need not be true, since the evidence to hand concerning the stars may perhaps be explained in a way hitherto undreamt of by human philosophy. Theologians looked askance at the building up of a new system from the shattered fragments of an old theory. The disordered state of the calendar made theologians look round for a remedy, if only for the sake of the Church's festivals. Cardinal Nicholas de Cusa (d. 1464) had been led to conjecture that the error lay not in the calculation, but in the entire system of the world, and that the world's centre and circumference needed readjustment. Nicholas, who had studied mathematics and astronomy in Italy under Toscanelli, was present at the Council of Basle, and there delivered a discourse on the reform of the calendar, that is still preserved.[4] Passing from obscure tradition to certain teaching, he marks the turning-point in the history of astronomy. For he was the first to utter the great truth : "The earth is a star like other stars." He put aside the objections from the old theory by pointing to the uniformity of the whole universe, which allowed no barrier to separate earth from heaven. Of course he could give no mathe-

2 Arist. *Metaph.*, I., 6. Albertus M., *de cælo*, II., 4, 1. Cfr. *Theol. Quartalschrift*, 1885, p. 50. Werner, *Ital. Philos.*, I., 79, 146.

3 Lect. xvii. l. ii. *de cælo*; see Hipler, *die Vorläufer des Nicol. Copernicus*, 1882.

4 Schanz, *Die Astron. Anschauungen des N. v. Cusa und seiner Zeit.* Rottweil, 1873.

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matical or physical proof; but what proof had other systems to offer? When theory is matched against theory, the palm should be awarded to the one that is simpler, and that is more suited to explain phenomena. Another advocate of the new system, but only recently known to fame, was Calcagnini, professor at Ferrara. Speaking of Cardinal de Cusa he says: "I hear that my view was "patronized in the last century by Cusa, a man of profound "learning and keen intellect, who was illustrious by the "purple, and still more by his writings. Oh! that I had "his commentaries! for aided by his ability I should have "been spared the trouble, or at least have been provided "with more solid proofs."[5] From this it would seem improbable that Cusa imported his theory from Constantinople. True, the doctrines advanced by Pythagoreans and Platonists may never have wholly died out in the Byzantine empire. Nevertheless the suggested importation is still unlikely, because Peurbach and Regiomontanus (who was intimate with learned Greeks) are silent as to the Pythagoreans.

Thus the ball was set rolling, and a survey was made of the ground, and the foundations were laid for a scientific proof of the system that is associated with the name of Nicholas Copernicus (Coppernicus). In the dedication prefixed to his book, Copernicus, in order to clear his system from the charge of novelty, scrupulously enumerates the views of the older philosophers. But of Cardinal de Cusa he makes no mention. From this silence we may certainly infer that he was unacquainted with Cusa's writings. But it by no means follows that Cusa's ideas were wholly unknown to him. Giordano Bruno, who was entirely influenced by Cusa's views and gained much of the credit that was due to the Cardinal, in his pompous way declared it to be self-evident that Copernicus had boldly proclaimed what Cusa had timidly suggested a hundred years before. Copernicus, he says, assumed a bold front

5 *Copernikanische Mittheilungen*, 1812, p. 78. *Natur u. Offenb.* 1879 and 1877, p. 742. Also *Kirchenlexicon*, 2nd Ed., III., 1079.

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in order that the true theory, which was better adapted for astronomical calculations, might gain toleration, even if acceptance were withheld. The spread of the doctrine in Italy is proved, independently of Calcagnini, by the fact that Dominicus Maria, Copernicus' tutor at Bologna, was thereby persuaded to assume a different latitude for certain towns. Italy indeed was the soil on which the seed of the new system grew up; but two Germans trained the growing plant and brought it to maturity. They were the men who first grasped the idea in its full significance.

Nicholas Copernicus was born at Thorn on Feb. 19, 1473. His father was an emigrant from Cracow. His mother was a German named Watzelrode. He studied at Cracow from 1491 to 1494, and in the autumn of 1494 he went to Bologna to study Canon Law. The registers declare him to be a German citizen. His uncle Watzelrode, Bishop of Ermeland (1470–1473) belonged to the same nationality. At Bologna he studied Greek, mathematics and astronomy, and took astronomical observations with his tutor. In the year 1500 he went along with his brother Andrew to Rome. Here Rheticus brought him forward as a mathematical professor. According to the custom then in vogue he lectured in public. Meanwhile he had become a member of the Chapter of Frauenburg. That he might prosecute his medical studies, the Chapter of Frauenburg granted him in 1501 a further leave of absence. From Rome he betook himself to Padua. In 1503 he graduated in Canon Law at Ferrara. About the year 1505 he returned to his native land, and lived in Heidelberg as medical adviser to his uncle. He did not, however, discontinue his astronomical studies. though his instruments were of a primitive sort. Want of exact information compelled him to answer in the negative a question put to him by the Lateran Council in 1514, in regard to the reform of the calendar. For he considered that the length of the months and the year, and the movements of the sun and moon had not yet been determined with sufficient exactitude. His further observations and the "Prutenical Tables"

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of E. Reinhold served as the basis for the reform of the calendar in 1582.

Meanwhile Copernicus was labouring indefatigably at the great work of his life,—the laying of a new foundation for a new system of the universe. It was begun as far back as 1509. In 1530 it was nearly ready. From all sides came earnest entreaties to publish it. High dignitaries in the Church like Cardinal Schomburg and Bishop Giese were most urgent in their entreaties. Still Copernicus was unwilling to accede to their wishes, as he thought further corrections were needed. Dread of ecclesiastical censure was out of the question. Till the end of his life Copernicus was engaged in correcting the MS., as the autograph discovered in 1854 bears witness. The most recent discoveries in Vienna and Stockholm afford convincing proof that he had previously published but once on the new system. At length, when life was drawing to a close he was prevailed upon to send his great work to press. Osiander and Schoner, two friends of Rheticus, the Wittenberg professor of mathematics who had befriended Copernicus, were entrusted with the publication. The work was published at Nürnberg in 1543 under the title: *De revolutionibus orbium cœlestium Libri vi.* When Copernicus, stricken down by a stroke of apoplexy, lay on his death-bed, he held a copy in his hands. The work was dedicated to Pope Paul III. For the Pope was held in such high esteem even in the remote spot in which the author lived that, as Copernicus thought, he could easily by his authority silence slanderous tongues. This indicates pretty clear the quarter from which Copernicus expected the storm to blow. His language is plain and straightforward: "If hair-brained babblers, ignorant of "mathematics, shall sit in judgment on my work and pre-"sume to censure and condemn it on the score of a pas-"sage in Holy Scripture which they maliciously distort to "their own ends, I shall not be troubled by their verdict "but rather despise it as rash and prejudiced. Lactantius, "a writer in other respects distinguished, but no mathe-

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"matician, as all the world knows, discoursed like a child "about the shape of the earth, and ridiculed those who "taught that the earth is spherical in form. Let not sci- "entific men therefore wonder if men of this calibre rid- "cule me. None but mathematicians can understand "mathematics."

Following the dedication to Paul III. is a preface which is wholly out of keeping with the firm conviction expressed by the author, in the dedication and in the body of the work. This preface, however, was substituted for the original preface by the publisher Osiander, who, in the hope of meeting the objections raised by the Reformers, designated the theories of Copernicus as new and wonderful *hypotheses* that might possibly be false. Bishop Giese and the friends of Copernicus were up in arms. They raised an indignant protest against this dishonorable proceeding. But their protests were of no avail to prevent the teaching of Copernicus being regarded till recent times as an hypothesis. The genuine preface only came to light with the original manuscript. It is as far removed from the clumsy forgery as the poles are asunder. The true preface shows that Copernicus united in a charming degree genuine scientific research with a true religious sense. He recognized astronomy as a science more divine than human, because it proclaims God's honour and glory. If any one spoke of his system, he at once broke in: "Not my system, but God's arrangement." It was this arrangement that had decided the point for him. He says: "After "assuming the motions ascribed to the earth in the following work, I found after years of painstaking research, "by referring the movements of the other planets to the "earth's circumference, and by calculating them according to the revolutions of each star, that not only would "observed phenomena be thereby explained, but also that "the series, magnitude, and orbits of all the stars in the "firmaments are arranged in such wonderful harmony, "that no part can be displaced without throwing the whole "universe into confusion."

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Copernicus had, indeed, no direct proofs to offer. He knew the objections that could be drawn chiefly from the parallax of the fixed stars and the apparent repose of the atmosphere. But he had laid a mathematical foundation for his system which subsequent calculations have verified. Nevertheless nothing short of a direct proof could controvert the accuracy of the minutely developed system of the ancients. Here, too, we have a key to the opposition raised by theologians and philosophers. Mere sense-evidence was their accepted criterion. The Ptolemaic system was, in their opinion, indisputably the basis of the Christian view of the philosophy of the universe. Now Copernicus gives the lie direct to this sense-evidence, and contradicts the letter of Holy Scripture. Moreover, he deprived the earth of its prestige as the centre of the universe, and degraded it to the rank of an ordinary heavenly body ; nay he represented it as being one of the smallest that revolve round another centre. Some thought the doctrine of redemption was in danger. The Reformers were the first theological opponents to lay siege to the new system. Luther in his usual coarse way held up to scorn the fool in Frauenburg who wanted to revolutionize astronomy. Holy Scripture, says Luther, tells us that Josue bade the sun not the earth to stand still. Melanchthon was in even greater dread of the principle involved and its consequences, and he urged the authorities to persecute with all their might and main such wicked and godless teaching. Not till a long time had elapsed, did the learned men of Wittenberg dare to hazard the theory of the earth's motion even as an hypothesis. Neither were mathematicians in a hurry to go against the current. In 1579, Galileo wrote to Kepler that the vast majority of mankind had rewarded Copernicus with naught but scorn and derision, because he had not made known his reasons for supposing that the earth moved. Bacon of Verulam, the founder of inductive science, sneers at Copernicus as a man who, without taking thought, would revolutionize all nature to save his calculations. The opinion of Copernicus which, he says, still

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held good, could be impugned not on astronomical grounds, because it does not contradict phenomena, but by the principles of natural philosophy correctly applied. These words of the celebrated Bacon, written in 1620, are worth emphasising because, in the trial of Galileo, we shall hear the same principles enunciated by less eminent philosophers and naturalists.

The attitude assumed by the dignitaries of the Church in the lifetime of Columbus was not without its influence on after-times. By far the great majority of Catholic theologians and philosophers stood loyal and true to the old system, and invoked the letter of Holy Scripture in its defence. But opposition properly so called sprang into being only when the question began to be debated from another point of view, and the authority of Holy Scripture itself seemed in jeopardy. Such was the case in Galileo's time. Galileo was born on February 15th (18th) 1564. He received his first lessons at Florence. In accordance with his father's wishes he went in 1581 to Pisa University to study medicine; but by preference he gave himself up to mathematical studies. To this period belongs the discovery of the isochronism of the pendulum, which was suggested to Galileo as he stood in the Cathedral of Pisa watching a lamp swinging to and fro. In 1586 want of means compelled Galileo to return to Florence. Nevertheless he continued to prosecute his studies in mathematics and physical science. The hydrostatic balance and the fundamental principles of modern mechanics were the result. During his sojourn in Florence he discovered and verified by experiment the laws of falling bodies, which are named after him. Thus, as Copernicus had undermined astronomy, so Galileo cut the ground from under Aristotelian physics. Not Aristotle but the book of nature was Galileo's standard. Nature promulgates true laws which, when reduced to mathematical formulæ, leave no doubt about the truth. In 1592 Galileo became professor of mathematics at Padua. From this time date his important declarations in favour of Copernicanism. Of its

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truth he was quite convinced, but he did not think his proofs convincing. The invention of the telescope in 1608 changed all. After hearing the telescope described, Galileo straightway constructed one, and pointed it to the heavens. His labours were crowned with many brilliant discoveries. Universal astonishment greeted the announcement that there are mountains and valleys in the moon; that the milky way and the nebula in Orion and others, are studded with countless stars; that the Pleiades number not seven but more than forty; that Jupiter has four revolving satellites. Nor did a long time elapse before Galileo discovered the rings of Saturn and the phases of Venus. Natural philosophers stood aghast at these discoveries. Their only defence lay in denying the alleged facts. They distrusted the mysterious glass and branded its revelations as illusory; nay, they proved *a priori* that these must be illusory. Meanwhile events marched as usual in the duel between natural philosophy and exact science. In the long run definitions and theories are no match for evident experimental facts. Galileo was the doughty champion of right. In 1610 he was appointed to the first mathematical chair in the University of Pisa, but was dispensed from lecturing.

But the conclusions drawn from the observations stood on a different footing. The Aristotelian axiom of the unchangeableness of the heavens was shaken to its foundation, but the Aristotelians would not surrender it. For to surrender would have been to accept the Copernican system. Jupiter's moons prove that the motion of the moon round the earth furnishes no argument against the earth's motion round the sun. Again, the phases of Venus admit of no other conclusion than that the planets revolve round the sun. Hence there was nothing to choose between the Egyptian system and Copernicanism. In 1611 sun-spots were discovered almost simultaneously by Fabricius, Sheiner and Galileo. This discovery dealt another blow at the doctrine of the unchangeableness of the heavens, since the sun itself was no longer pure and intact. In his work on sun-spots (1612), Galileo declared that his convic-

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tion of the truth of Copernicanism amounted to an absolute certainty. His declaration encountered a storm of opposition from academies of learned men, the force of which was broken by the enthusiastic applause from others, even the highest dignitaries of the Church. Philosophy and theology were at that time so closely connected that, once the threshold of theology was crossed, the struggle would be rife with danger. Here lay the temptation for adversaries who were no match for experiment. It is not surprising that they were soon discomfited. Galileo was perhaps too sharp and merciless in following up his advantage. These skirmishes prompted him in 1612 to ask his friend Cardinal Conti, who resided in Rome, what would be the attitude of theologians towards the new system. Holy Scripture, he replied, was more adverse than favourable to the peripatetic principle that the heavens are indestructible. But the doctrine of the earth's motion, taking the words in their accepted sense (and only necessity could authorize a different usage), was another matter. External circumstances prompted the celebrated and important letter of December 21, 1613, to Castelli, professor of mathematics at Pisa, in which Galileo laid down the above principles of exegesis. In 1614 a Dominican, Caccini by name, brought forward the subject in the pulpit at Florence and gave information to the Inquisitor, Lorini. Caccini's master sent a *denunciatio* to the prefect of the Roman Congregation of the Index, enclosing a copy of the letter to Castelli. Galileo, hearing of these proceedings in Rome, enlarged upon his letter to Castelli in a letter addressed to the grand duchess Christina. The principles are correct but the conclusions are too far-reaching. Theology is so closely imprisoned that it ceases to have any bearing on the other sciences.

In December, 1615, Galileo went to Rome. Again he received the same hearty welcome as had been extended to him in 1587 and in 1611. He was thereby emboldened to push on his cause with more zeal than discretion. On February 19th, 1616, two propositions were submitted to

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the consultors of the Holy Office: "The sun is the centre "of the world, and consequently has no local motion." "The earth is not the centre of the world; nor, again, is "it immovable, but it moves round itself with a diurnal "motion." The consultors expressed their opinion as follows. The first proposition is philosophically silly, and formally heretical, inasmuch as it directly contradicts many passages of Holy Writ, taken in their literal sense, and as they were commonly understood by the Fathers and theologians. The second proposition lies under the same philosophical ban, and is at least theologically erroneous. The Holy Office, in the session held on February 25th, adopted this judgment. Thereupon the Pope commissioned Bellarmine to intimate to Galileo that "he must absolutely "refrain from propounding or discussing such a doctrine, "and that he would be thrown into prison unless he com-"plied." On the day following (February 26th) Bellarmine delivered the message to Galileo in his own private apartments. The tenour of his communication was: "Galileo must abandon once for all the opinion that the "earth moves, and that the sun is the centre of the world, "and immovable; he must not teach or defend it by word "or writing, or maintain it in any way; otherwise the "Holy Office would institute proceedings against him. "Galileo listened to the order with composure and prom-"ised to obey." This was duly reported by Bellarmine to the Inquisition in the session held on March the 3rd, under the presidency of the Pope. On the decree being laid before the congregation of the Index, the works of Nicholas Copernicus on the revolutions of the heavenly bodies, the writings of Diego of Stunica on Job, and those of the Carmelite Foscarini on the earth's motion were put on the Index. This decree of March the 5th proscribed the works of Copernicus and Diego until they should be corrected. But Foscarini's work was forbidden altogether, because the false Pythagorean doctrine that the earth moves and the heavens are immovable (which is in absolute contradiction to Holy Scripture) had already gained wide accept-

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ance. The decree was subscribed as usual in the Pope's name by Paul Sfondrati, Cardinal of S. Cecilia and Bishop of Albano, and by Francis Magdalenus, Secretary.

To form a just estimate of this decision it is necessary to keep steadily in view the state of exegesis, philosophy, and natural science at that time. The entire school of exegesis was opposed to the surrender of the literal meaning.* The authorities of the Church grew more and more anxious as dangers were fast thickening round the old faith. The Reformation had tried to gain a footing even in Italy. Many learned men favoured the false Renascence. Philosophy was then Aristotelian. To gain an idea of the tenacity with which philosophers clung to old names and ideas, one should read Galileo's dialogue on the system of the universe. Natural science was closely allied to philosophy. Galileo had, indeed, dug deeper foundations for Copernicanism, but the proofs, on the whole, were little better than arguments from analogy. Tycho Brahé's system, which made the sun and the planets move round the earth, explained observed phenomena quite as well, though not so simply. Galileo made no use of Kepler's laws, and never quite surmounted the atmospheric difficulty. So it may be truly said that a scientific proof of Copernicanism was not yet forthcoming; nor did it appear till long afterwards. Hence it is easy to see how theological judges, ever breathing an Aristotelian atmosphere, arrived at their decision, however much we may regret that decision. The decrees of the congregation had certainly no dogmatic

* The reader who desires to master this question must never lose sight of this *canon* of interpreting Scripture The Church cannot abandon the literal sense of a passage of Holy Scripture, unless forced thereunto by *real evidence* to the contrary. Hence theologians are bound to act in the same way. Thus, in a scientific question like the present, theologians and commentators are necessarily guided by the evidence of scientific men. But their testimony must be nothing short of *evidence;* and until it reaches the level of evidence they are bound to hold fast to the letter of Scripture. In this sense science is a *negative* canon for interpreting Scripture. To form a just judgment on the present case requires a large acquaintance with the organic constitution of the Catholic Church, and its complete action as guardian and interpreter of the revelation entrusted to its keeping. Moreover the *substance* of the case must be carefully distinguished from its *accidental* surroundings. In the Galileo case there may be points that even a good Catholic may regret, but no substantial blame attaches to the Church or its authorities.—*Tr.*

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force. Then, again, it was allowable to use the system as a "hypothesis;" and this left a loop-hole for science to escape. For, since Copernicus himself had published a *Commentariolus de hypothesibus motuum cælestium*, the "corrected" *Copernicus*, as we understand the term, might render yeoman service to science. For the rest Galileo was not further molested. On May the 26th, Bellarmine explained that he had not been obliged to abjure his teaching, but had only been admonished not to defend and maintain his doctrine that the earth moves. In order to prove the acts spurious it is alleged that this is in contradiction with the events of February 25th and 26th. But these inferences must now be regarded as groundless.

Galileo was now obliged to be more reserved. In *Ebb and Flow*, and the *Gold Balance* (*Il Saggiatore*, *1623*), the latter directed against the Roman Jesuit Grassi, he covertly advocated the new system without giving offence. In 1623, when his friend Cardinal Barberini became pope under the title of Urban VIII., he tried, without success, to make the Pope a partisan. He now set to work to revise the Dialogue that he had been preparing for twenty years. In 1630 he asked and obtained permission to print it in Rome, on condition that the printed sheets, the preface and conclusion were submitted to the board of censors. In the end, however, he was allowed to print it at Florence. It was published on February the 22, 1632, bearing a double *Imprimatur*, although the Roman *Imprimatur* held good only in Rome.[6] The book created an immense sensation, but opposition was fanned into a flame anew. Some have imputed personal motives to Urban VIII. He felt hurt, they say, at the clumsy defence of the Aristotelian natural philosophy which Simplicius, a character in the Dialogue, puts into the mouth of the Pope. And again he is said to have been angry with Galileo for countenancing the super-

6 The title is: Dialogo di Galileo Galilei, dove nei congressi di quattro giornate si discorre sopra i due massimi systemi del mondo, Tolemaico e Copernicano, proponendo indeterminatamente le ragioni philosofiche e naturali tanto per l'una parte che per l'altra.—For further details see Schanz, *Galileo Gal. und sein Process*, Würzburg, 1878. *Kirchenlexicon*, v. 18.

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stition of astrological births. Then also the attitude of the Roman Jesuits was hostile to Galileo. But apart from all these considerations the interference of the ecclesiastical authorities is not difficult to understand, when the negotiations of 1616 are borne in mind. A special commission forthwith came to the conclusion that Galileo had transgressed the order laid upon him. For he had maintained absolutely, and not as an hypothesis, that the earth moved and the sun was at rest, and had falsely referred the ebb and flow of the tide to this cause. Moreover he was said to have deceitfully suppressed an order of the Holy Office of 1616. Galileo, now in his 70th year and broken down with age and infirmity, was summoned to Rome, where he arrived after many delays on Feb. 13, 1633. He took up his residence with the Toscan ambassador. Everywhere he was respectfully treated. He resolved, however, to make matters as smooth as possible. His scientific conviction was as firm as his faith. After the first examination he was detained in the palace of the Holy Office, occupying three spacious rooms in the Fiscale. But he was never in prison. Having been persuaded in private to give up his teaching as erroneous, he put forth on April the 30th a confession couched in terms of deepest humility. He even volunteered to continue the Dialogue and write his own refutation. Leave was now given him to return to the ambassador's house. On May the 10th he produced his apology and the original attestation of May the 26th, 1616. On June the 16th the Pope, in a session of the Congregation, ordered Galileo to be interrogated under threat of torture. If he persisted in his views he was to be made to solemnly abjure his teaching before the Holy Office, and to undertake not to spread it any more; and then he was to be imprisoned. To all these terms Galileo agreed on June the 21st. Torture never passed beyond the domain of a threat. Galileo returned to his apartments in the Fiscale. On June the 22nd Galileo had to abjure his doctrine in the Church of Santa Maria sopra la Minerva. The decree sets forth that Galileo, by maintain-

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ing a doctrine contrary to Holy Writ, had drawn upon himself the suspicion of heresy. All pains and penalties, however, would be remitted if he would honestly and sincerely abjure and execrate the said heresies. Galileo knelt down and made his abjuration. He confessed that he had disobeyed the injunction of February the 16th, 1616, and rendered himself suspect of heresy. And he abjured the "aforesaid errors and heresies, and all other errors, and "every sect that is hostile to the Holy Catholic Church." The exclamation *E pur si muove*,* which he is alleged to have uttered when rising, must be relegated to the domain of fable. The hair-shirt, too, must be consigned to the same ignoble fate. Imprisonment was commuted into free confinement, firstly in the Ambassador's house, secondly in the Archbishop of Siena's palace, and lastly in his own villa at Arcetri near Florence. Here, blind and feeble, Galileo died at a ripe old age on January the 8th, 1642.

This much-to-be-regretted trial was consequent upon the proceedings taken in 1616. Decision and trial may be explained substantially in the same way. Individually Galileo was harshly treated; but his treatment, viewed in the light of the penal enactments then in vogue, was exceedingly lenient. The position of affairs rendered an adverse judgment inevitable. Galileo's violence and imprudence brought matters to a crisis. Later on he became quite disheartened. The new system had received a check from the condemnation, and it was prevented from spreading, especially in theological circles. But the advantages accruing therefrom cannot be too highly estimated. The decree, like that of 1616, had not the Pope's signature, but was an ordinary Congregational decree. It was officially promulgated, but not rigorously enforced; neither did people take it much to heart. Astronomers continued to prosecute their studies assiduously, as Galileo's correspondence proves. As we shall see presently, the direct grounds

* "And still it moves."

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only came to light later. It would have been well if, on both sides, judgment had not been clouded by passion. In no case like the present has the virus of critics and the easy-going credulity of apologists so effectually succeeded in diverting the main point at issue from its natural and historical channel.

The third in the trio of the coryphei of the new system is Kepler. Born on December 27th, 1571, at Weil, a town in Würtemberg, he went to Tübingen University in 1589, to study theology in the Protestant Seminary. Mästlin, the mathematician, an advocate of the Copernican system, soon gained great influence over the talented young student. In 1591 he took his degree, and crossed over to the theological faculty for his three years' course. But the "frightful intolerance" that the professors of theology displayed in their zeal for a formulary of faith (concordia), and in maintaining that Christ's body was everywhere, was not to his taste.[7] His predilection for the new system made him still more disliked. The theologians pronounced him unfit for the ministry. In 1594 he went as a mathematical professor to Gratz in Steiermark. Here it was his duty to teach mathematics and to draw up the calendar. In this latter work he felt constrained to make large concessions to prevalent astrological superstitions. In the *Prodromus* published in 1596 he foreshadowed his grand idea: the organic unity of the planetary system. The proofs of the thesis were still unsound and inadequate. He sought to solve the *Mysterium Cosmographicum*, the position and motion of the planets, by the five regular bodies. His stay in Gratz was cut short by the counter-reformation. The Jesuits obtained permission for him to stay, but he found his position too uncomfortable. As Mästlin could find no suitable opening for him in Tübingen, and the ministry was closed against him in Würtemberg, he applied to the Emperor for a situation. In 1600 he became Tycho Brahé's assistant in Prague. Tycho wanted Kepler to work out

7 Wolff, *Geschichte der Astronomie*, p. 283. Zockler, *Zeugen Gottes*, I., 165 seq.

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the planetary tables he had drawn up. Shortly afterwards Tycho died. Thereupon Kepler was commissioned to work out the Mars theory with the aid of Tycho's observations. It was while engaged in this task that he first hit upon the correct inductive method. He defined as many points of Mars as he could, and joined them together. The result was an ellipsoid, which presently developed into an ellipse, with the sun in one focus. In this way Kepler's first law was discovered. The second law resulted from the position the sun occupied with regard to the planets. It lays down that the "radii vectores" traverse equal areas in equal times. Both laws were published by Kepler in his *Astronomia nova demotibus stellæ Martis* (1609). In the dedication to the Emperor Rudolph II., he thus writes: "Astronomers were powerless against the god of war. But "that splendid field-marshal Tycho, after twenty years "of night-watching, found out all his warlike devices. "And I, following the course of mother earth, have cir-"cumvented him in all his tortuous paths." On the death of Rudolph he went to Linz, religious bigotry again barring his return to Würtemburg. Subsequent investigations on the harmony of the spheres led in 1618 to the discovery of Kepler's third law which states that the square of a planet's periodic time is proportional to the cube of its mean distance from the sun. This third law was published in 1619 in the *Harmonices Mundi Libri V.* In 1620 and 1623 he went to Leonberg to prove his mother guiltless of witchcraft. Then the dangers of the counter-reformation induced him to settle at Ulm. Here in 1627 he issued his third great work, *Tabulæ Rudolphinæ.* In 1630 he died at Regensburg, whither he had gone to lay his claim for arrears of pay before the Reichstag. Galileo corresponded with Kepler from 1597, and the two exchanged works. And yet Galileo makes no reference to Kepler's laws. Galileo cannot possibly have been ignorant of them, nor would he be likely to undervalue them; but they could not have been much help to Galileo in his physical astronomy. They were formal laws that corresponded exactly

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with observed phenomena. But they barely affected physical astronomy for two reasons: Most planets deviate but very slightly from the circular orbit, and astronomers had already fixed on the three points in the circle that, as it were unconsciously, gave the idea of the ellipse. The character of the two astronomers was so different, and their methods so diverse, that it would be unreasonable to expect either to be enraptured with the laws or discoveries of the other. By this we may gauge the practical bearing of the laws on the controversy then raging as to the system of the universe. It was far easier, than in Galileo's case, for the advocates of the ancient natural philosophy to offer opposition to these theoretical laws, so long as the physical causes regulated by these laws were absent.

To Newton belongs the merit of discovering the physical causes that gave to Kepler's laws their full significance. Thus the reformation in astronomy was accomplished. Isaac Newton was born January 5th, 1643, at Woolsthorpe, near Grantham, in Lincolnshire. At Cambridge, whither he repaired in 1660, he had Barrow for his professor in Mathematics and Optics. When a school-boy he busied himself with the problem of which Copernicus, Kepler, Bouilliau, Borelli and Pascal had had faint glimmerings, viz. the force of gravitation. In 1666 he was pretty sure of the main points. The story goes that the sight of an apple falling to the ground led him to enquire whether the force that makes the apple fall also retains the moon in its path round the earth. But as the data were incorrect the calculations were wrong. When, however, practical astronomers furnished true measurements, he found that the calculation tallied. He was now enabled to enunciate the law of gravitation: "Every planet is attracted by the sun "with a force which is in direct proportion to its mass, and "in indirect proportion to the square of the distance." In *Principia mathematica philosophiæ naturalis* he proved mathematically that this law lay at the foundation of astronomy and of the whole universe. Mädler and Wolf say "that "all the true and correct discoveries hitherto made in ref-

"erence to the motion of the heavenly bodies were now "conclusively demonstrated. Their general bearing was "established, and their inner foundations surely laid." Was all doubt removed? For astronomers, but not for the lay public. For gravitation, being something theoretical, is always open to the objection that it cannot be proved. To this day its nature has not been successfully determined. On the other hand, many are now beginning to call it in question. It is at once strange and beneficial that doubt as to the truths of natural science is not silenced till the most rigid proofs are forthcoming. Without direct proof the claim of those truths to respect will always be called in question. However overwhelming the weight of indirect proof, direct proofs are still wanting.

Copernicus found it necessary to prove his system directly by the annual parallax of the fixed stars. For the earth's annual motion must give a maximum of latitude to the star at the time of opposition, and a minimum at the time of conjunction. But as his instruments were imperfect he failed. After countless observations Bradley (d. 1762) at length noticed slight annual divergences. But the fact that their extreme values coincided with their squares made it clear that these divergences did not affect the parallaxes, but were owing to the aberration of light. By this means, however, another proof, though not the one directly sought after, of the earth's motion round the sun was unexpectedly obtained. For this motion alone can explain why the stars do not lie exactly in the spot indicated by the ray of light, but in the direction indicated by the resultant of the motion of light and of the earth. This action is usually illustrated as follows. A cannon ball fired at a train in motion is supposed to make two holes, one at the side it enters, and another on the side it goes out. A line drawn between the two holes will give the direction in which the cannon ball is moving, but it will not indicate exactly the place of the gunner, because the train was moving onwards while the ball was passing from one side to the other. When Olaf Römer in 1675

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observed the darkness of Jupiter's moons, the theory that light was instantaneously transmitted had to be abandoned. And the velocity of light being found to be about 40,485 miles, this aberration of the light proved to a certainty the earth's motion. It proved likewise that the earth moves in an elliptic path. For the apparent motion of the stars has an annual period, and in its course describes a small ellipse whose great axis is 40′ 5″ in all.

The long sought for parallax of the fixed stars was at length determined. Bessel, after a series of three years' observations, noticed a slight parallax of the fixed star 61 Cygni; others followed. The solution of the question is still attended with the greatest difficulties, the delicacy of our instruments notwithstanding. The contention put forward by Copernicus must now be urged with double force, viz., the fixed stars are so far off that they show no parallax even for the earth's immense path of forty millions of miles. The few stars of which the parallax has been detected are the nearest, and yet they are distant more than twelve billions of miles. Nevertheless so many parallaxes have already been demonstrated that the fact must be regarded as certain.

Nor was the earth's diurnal motion to remain without direct proof. Riccioli in his Almagest had raised against this revolution the objection that a freely falling body must decline slightly to the west. Newton, on the other hand, contended that the declination must be towards the east. This is clear from Galileo's law of falling bodies. Every body contains its own original velocity. But a body at a greater elevation has a greater velocity than the earth's surface, because when a ball revolves the velocity increases with the distance from the centre. Since therefore the earth moves from west to east a falling body must decline to the east. Repeated experiments showed Newton to be right. More tangible than these subtle processes are the experiments with the pendulum which Foucault, the French physicist, first performed in the Paris Panthéon in 1851. The floor was strewed with sand and a pendulum swung

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in the dome. The pendulum, which, according to the laws of physics, should retain its plane of motion unchanged, showed a declination to the west, that corresponded exactly with the latitude of the place (per hour $15^\circ \sin \phi$, $\phi =$ latitude). At the pole it would be as much as 15° per hour. The truth of this result was confirmed by many other experiments.

Any doubt that still lingered as to the earth's twofold motion was dispelled by this ocular demonstration. Theoretical astronomy could not fail to extort admiration from the educated when Leverrier, in 1847, to account for certain declinations in the planetary system, fixed on a new planet, Neptune. Now even the uneducated cannot but marvel at the results of science. None but the eccentric can, wilfully or unwilfully, close their eyes to its wonders.[8] For the apologist the foregoing enquiry has, for other reasons, a special interest. When we reflect how many years of painstaking and laborious research passed before the new system was clearly proved, we should be lenient in judging the philosophers and theologians who lived more than two centuries ago. They were prejudiced in favour of the old system, and had no direct proofs of the new. All the world knows, too, that new ideas are not propagated at once. There is ingrained in the human mind a disposition to carry on *guerre à outrance* against new theories.* But in this case scientific prejudice was allied to a powerful theological prejudice. The conservatism, that was so potent a factor in ancient legislation, made its power felt here also. As a rule, ordinances disappear only when they have grown impracticable. So it fared with the decree of 1616. On May the 10th, 1757, the Congregation resolved to remove from the Index the decree prohibiting all books that taught the motion of the earth and the stationary character of the sun. In 1758

8 Schoepfer, *Die Widersprüche*, etc. [Contradictions in astronomy arising from the Copernican system, but disappearing in the opposite system.] Berlin, 1869.

* New practical discoveries share the same fate, as the history of the introduction of Railways into this country abundantly proves.—*Tr.*

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the work of Copernicus was no longer named on the Index, although the works of Galileo, Foscarini, and Kepler remained. A work of Professor Settle, setting forth the motion of the earth, received the *Imprimatur* in Rome on August the 16th, 1820. On September the 11th, 1822, the Holy Office declared that it no longer forbade the publication in Rome of works that teach that the earth moves and the sun stands still, *juxta communem modernorum astronomorum opinionem*. The names of all works bearing on this subject were expunged from the catalogue of the Index published in 1835. The number of 18th century Protestant theologians before Knack's time who combated the new system on Scriptural grounds was not small.[9]

9 See Grisar, *Galilei*, p. 268, seq. Stähelin, *Jahrbuch für Protest. Theol.* 1884, p. 368, seq.

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CHAPTER XVII.

THE UNITY OF THE HUMAN RACE.

Holy Scripture tells us that God made man to His own image and likeness. As male and female He created them. In Chapter II. the event is described more fully and more precisely. God formed man's body from the dust of the earth, and breathed into his nostrils the breath of life. But Eve, Adam's consort and the mother of the living, was formed from a rib of the sleeping Adam. It is not our present purpose to offer a theological or an exegetical explanation of these passages; they are merely cited to prove that Holy Scripture teaches the unity of the human race.

The simple, easy, and childlike strain in which the narrative is written is patent to all. No one, however, will dream that Almighty God took clay into His hands like a potter and gradually gave it shape and consistency. "It is really too childish," says S. Augustine, "to suppose "that God formed man from clay with bodily hands." "And as God did not fashion him with bodily hands, "neither did He use throat and lips to breathe on him." "God is said to breathe into man's face, because the fore "part of the brain, from which all the senses take their "rise, is located in the forehead."[1] S. Augustine, indeed, does not dare to decide whether man came forth from the *prima ratio causalis* in a full-grown state, or by a process of gradual development. Subsequently he declared in favour of the *perfecta moles membrorum*. Every reader,

1 *De Genesi*, 6, 12. 71, 2., 17, 23.

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however will glean from the narrative that *man's body comes from the earth, and his soul from heaven.* This truth, accentuated elsewhere in Holy Scripture, found frequent expression in the literature of the Aryan nations. Man is conscious of his double descent, from heaven and from earth. He claims relationship with a father in heaven, although his origin lies in the dust of the earth.[3] To ask whether man has one rib less than woman is to trifle with the subject. Rather it behooves us to recognize the deep thought underlying the simple narrative, that man is *by creation* the lord of woman, and the principal, representative and head of the human family. Thus only is it possible to establish Adam's physical, spiritual and moral headship. The whole human race, then, according to Holy Scripture, is descended from one physically united pair. Pre-Adamites are impossible. Apart from Adam there has been no race, at least on earth. An exegetical difficulty arises out of Genesis iv., 14–16; but it affords as little ground as Romans v., 14 for Isaac Pereyre's contention, that Genesis represents Adam as the progenitor of none but the Jewish race. The Old and New Testaments repeatedly proclaim that the human race is one, in the strict sense of the word.[4] To other planets Holy Scripture pays no heed. Genesis deals with the earth and its people. As far as Genesis is concerned, matters that have no bearing on these are non-existent. Nor is it at all clear that later writings take a wider view.

What does faith teach in regard to the question whether the other heavenly bodies may be inhabited? In answering this question the conclusions drawn from other fundamental dogmas must not be ignored. The Incarnation and Redemption were advanced against the Copernican system; they are made to tell still more against the heavenly bodies being inhabited. Nevertheless, when it is said that Christ died for all men, it means after all the men on

[3] Max Müller, *Wissenschaft der Sprache*, vol. 2, p. 425.
[4] "And hath made of one all mankind to dwell upon the whole face of the earth."—Acts xvii., 26. See Heb. ii., 11.

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earth and no other. About other beings nothing is said. Again, the Schoolmen taught in opposition to Anselm, that the Incarnation was not an absolute necessity. Some, however, held that even apart from sin the Incarnation formed part of God's eternal plan ; nor did several Incarnations seem to them impossible.[3] Why then strain the words of Holy Scripture? Why not rather admit other possibilities for rational beings in other planets? Perchance they did not fall in their progenitor and head ; may be they fell and were redeemed by an Incarnation of their own, or in some other way ; perhaps God in mercy restored them to favour. But, on the other hand, it may be asked, why should we be so eager to people the stars, when we are absolutely without information respecting them ? The answer is easy. We merely wish to draw out the consequences of what has been already said. If the earth and the whole universe have been formed in the manner described ; if elements and movements are proved to be similar, analogy warrants the conclusion that similar inhabitants are living where the conditions are similar. The fancies and conjectures with which poetry and folklore for centuries delighted learned and unlearned alike, are demanded by modern astronomy as a hard conclusion from general laws. If other planets, Mars for example, can be demonstrated to have physical conditions similar to those of the earth, they too will be inhabited. Then, again, there are other solar systems which have likewise their own planets. Surely no man, save him that would measure the universe by a two foot rule, will argue that the distant starry worlds, which existed thousands of years before light reached the human eye, were made solely and wholly for this tiny earth and its people.

Nevertheless, since no direct proof on this point is or hardly ever will be forthcoming, we must limit our enquiry to ascertained facts and realities. The individuals that go to form the human race on earth are one in descent. The

3 Pohle, *Die Sternenwelten und ihre Bewohner*. Cöln 1884, 1885. *Katholik* 1886.

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doctrines of original sin and redemption are based on this community of descent. By one man sin and death, and by one man grace and life have come into the world. This intimate connection between unity of race and the dogma of redemption prompted Augustine, Lactantius and others to deny the existence of the Antipodes. Ethnographers, too, were obliged to be somewhat circumspect. Man is by nature so conscious of the unity of his race, that this unity is traditional among all nations that have preserved any account of man's origin. Nor is man now, in point of scientific knowledge, isolated as he was in ancient times. We no longer confine our attention to the thoughts and wishes of individual men, with their sense of power and duty, but take a more comprehensive view. Our theme is humanity; the human race is our study. As the vast universe, with its forces and laws, and its manifold plans and developments is one in work and design, and came forth from the hand of the one all-wise Creator, so the various races of men that have lived in different ages and climes form one great family that sprang from the same ancestors, from one stock. The distinction between Greeks and Romans, Jews and Gentiles, slaves and freemen has been obliterated, for all men are brothers. Christianity was the first to beat down the hateful wall of separation that egotism and pride had set up. Christianity shewed that all men are the children of one father, and the heirs of one house. Science, too, has been compelled to acknowledge this common humanity. The discovery of America unexpectedly brought to light a new race. The learned were as much perplexed as Pliny of old, when he set eyes on the black Ethiopians. Their convictions were shaken. Naturalists and missionaries assigned the Redskins to another Adam, or denied that they were created by God. Pope Paul III. had to issue a Brief, asserting that the Indians had equal rights with other men. Later on selfish slave-dealers, egged on by the learned, tried to widen to the uttermost the rift between Whites and Blacks, by declaring dominion and slavery to be their

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respective birthrights. This, however, notwithstanding, proofs of the common origin of all races are now coming in thick and fast. Some Darwinians, in direct antagonism to their own principles, obstinately maintained the stability of the various races. But, despite all obstructions, modern naturalists have marched forward towards the goal of unity. Polygenists are fast sinking into disrepute, and the unity of the species is coming to be recognized.[4] Philologists have likewise grown in prudence and discretion. The physical and spiritual differences existing between men still present many difficulties; there is, however, no danger to faith so long as a common origin is allowed to be possible.

However much people differ in size and colour and hairiness, in the skeleton, in the formation of the skull and so forth, still common characteristics are to hand that unite the several groups into races. The very name of *race* indicates the meaning of the principle of division. For it was chosen on the supposition that all races form one species. The fact that all races cross and are fertile, affords one among several verifications of this supposition. Crossbreeds are often more fertile than alliances in the same race. As long as this common characteristic holds good, the unity of the human species is a necessary consequence. Clearly therefore the differences of race are not essential nor absolutely unchangeable. The characteristics of each race are found in isolated and exceptional instances in other races. Differences of race are as old as history, yet no classification has been generally accepted. Linnæus classified races according to their respective countries: (1) Red Americans. (2) White Europeans. (3) Yellow Asiatics. (4) Black Africans. Blumenbach, whose system has found most favour, prefaces it with the remark that

4 Polygenists: *Agassiz*, *Burmeister*, *Oken*, *Carus*, *Vogt*, *Schaaffhausen*, *Giebel*, *Hamilton*, *Smith*, *Baker*, *Nott*, *Gliddon*, *Scott*, and others. Defenders of Unity: *Alex. v. Humboldt*, *Blumenbach*, *Prichard*, *Linnæus*, *Buffon*, *Cuvier*, *Geoffrey St. Hilaire*, *J. v. Müller*. *Retsius*, *Baer*, *H. v. Meyer*, *Burdach*, *A.* and *R. Wagner*, *Quatrefages*, *Owen*, *Flourens*, *Peschel*, and others. See Schneider, *Naturvölker*, I., 15.

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the innumerable varieties imperceptibly pass into one another. He then distinguishes five varieties: (1) Caucasian. (2) Mongolian. (3) European. (4) American. (5) Malay. Worthy of note also is Peschel's modern classification: (1) Australian and Tasmanian. (2) Papuans of New Guinea and the adjoining Islands. (3) Mongolian tribes, i.e., Asiatics of the Table-lands, Malays, and Polynesians, and the aborigines of America. (4) Dravidian, or the inhabitants of Eastern India not of Aryan descent. (5) Hottentots. (6) Negroes. (7) Inland tribes (Caucasian). This classification has the advantage of attempting to give the races in an ascending scale. The bulk of the population of Central Africa are generally designated as Negroes, and it is usual to characterize the negro type by black woolly hair, prominent cheek-bones, pouting lips, and black skin. Later researches, however, have shown that this type exists in only a few of the wild stocks on the Slave Coast. At length these characteristics get so toned down, that this race forms a transition to the inhabitants of Melanesia and the other islands. The same is true of the Mongolians. It would seem therefore that race-differences were not formed till the tribes had migrated and settled, and that they now remain constant unless interfered with from without.[5] Once the type has set firm through hundreds and thousands of years, individuals easily lose all capacity for variation. Even change of abode and of climate is unable to revive it.

Nevertheless the experience gained in America during three hundred years has shown that the colour and facial expression of negroes are undergoing a slow change. And the change would have been still more marked, had not slaves been constantly imported from Africa. It is very striking in those who have mixed with other races. No special reason can be assigned why in the Caucasian race

5 Bastian, *Das Beständige in der Menschenrassen und die Spielweite ihrer Veränderlickkeit*. Berlin, 1868. On the whole anthropological question see Rauch, *Die Einheit des Menchengeschlechtes*. Au.burg, 1873, p. 413, seq. Güttler, *Naturforschurg und Bibel*, p. 201, seq.

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the hair changes from the fairest auburn to a dark black. The shades of colour vary among the several peoples of the same race. Thus by comparing Germans, English, Greeks, Italians, Spaniards and Armenians, who all belong to the Caucasian race, a great variety of colours will be obtained. These people are all known to history. Doubtless climate and mode of life were great factors in bringing about these changes. Doubtless, too, the first immigrants were endowed with an unusually large capacity for accommodating themselves to circumstances, because men were still in their childhood, and uninfluenced by long established usages. The same remark applies to their dwellings. Then, again, the influence exerted by the special climatic conditions of each country was demonstrably very different in those early times. Race is the gradual outcome of the mutual action and reaction of people and coun try on each other.[6]

In nothing is this brought out so clearly as in colour. Colour is not merely external. Its foundations lie deep down in the organism. It supposes a greater change than is usually ascribed to the power of the sun. Colour is caused by the carbon pigment found in the Malpighian cells. These cells are also found in the coloured places of the white man's skin. The sun cannot suddenly effect this transformation, but it may further it in the course of time. A change in the colour of the skin may have easily been caused by the sun acting in conjunction with moisture, temperature, manner of living, and other climatic factors. The *physiological* explanation is that respiration, being retarded by heat, fails to change all the carbon into carbonic acid. The light playing on the surface materially aids the process. Parts not exposed, like the sole of the foot and the palm of the hand, are less dark even in the negro. Arabian women, who go about well wrapped up, are as white as Europeans. Even in the same country and climate this influence acts in different degrees, although

6 *Natur und Offenb.* 1885. p. 109, 354. Schneider, I., 12.

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the skins are generally darkest in hot countries. Anyhow, side by side with secondary and accidental causes, light and climate will always be regarded as the chief factors in producing the change. Equally certain is it, as may be seen by observation, that the sunlight affects the colours of animals and plants. The case would be somewhat different were it supposed, not that the dark races have been derived from the fair, but the fair from the dark.[7] Such an assumption, however, being utterly at variance with the commonly received view, is not yet ripe for discussion. Other differences, in the skeleton and formation of the skull for example, are less important. Occupation, and manner of living, and malformations, intentional or otherwise, may have had their share in producing a clear but variable type in a short time. Anyhow, such deviations in the animal world do not hinder the various races from forming one species. In man the difficulty is even less. For as the races are generally fertile, intermediate forms are everywhere possible, and these act as links and transmission agents. Blumenbach has pointed out that transitional forms grow more and more numerous. Humboldt considers that the many intermediate stages in skull formation and in the colour of the skin are a strong plea for unity.[8] The transition of races is made still clearer by modern researches. The American stock is the connecting link between the Caucasian and the Mongolian ; the Malay bridges over the Caucasian and the Negro.[9] The difference between the highest and the lowest types may well be greater than that between the lowest human and the highest animal type ; but, as in the species of animals, the intermediaries equalize the difference and leave the human type unaffected. The orang-outang is brown like the Malay ; the gorilla and the chimpanzee are black like the Negro. But neither all Malays nor all Negroes have the

7 Lippert, *Culturgeschichte der Menschheit in ihrem organischen Aufbau.* Stuttgart, 1886. Lotze, Vol. II., 10.

8 *Kosmos.* Vol. I., 379. Schaaffhausen, *Anthrop. Aufsätze*, p. 165, seq.

9 Gloatz, *Specul. Theologie*, Vol. II., 722. *Natur u. Offenb.*, 1885, p. 230, 495. Schneider, Vol. I., 16, 19, 22.

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same intense colouring. Similar climatic influences may have been at work to produce similar results in both man and apes. Whether the orang-outang has a round skull like the Malay, and whether the chimpanzee's skull is elongated like that of the Negro, are points still hotly debated by the learned ;"[20] in any case the identity would not be sufficient to establish descent.

Nor, again, is the distinction into higher and lower races justified by *Anatomy*. The Caucasian has no claim to the highest place, for other races are equally complete, not to say adapted to their environment. The Negro can endure heat and cold, and withstand fatigue better than the Caucasian and American. And in this respect the Malay, climate notwithstanding, is superior to the European. In intellect, however, the case is altered. No one denies that the very lowest races are still human. But there is a widespread opinion that some races are, and have been low, and will never rise. Darwin could hardly believe that the inhabitants of Tierra del Fuego were men. Similar stories are told of Australians and Polynesians, and in the case of the Negroes have passed current as an axiom. Intellectual inferiority is regarded as a specific characteristic of the Negro race, especially of those stocks that are the typical representatives of the race. It is likewise pretended that the ape approximates to man in the formation of the brain. With the physical differences we have already dealt, but speech and reason clearly demonstrate that the intellectual difference between the ape and the Negro is specific ; whereas there is a difference of degree only between the Negro and other races. The intellectual inferiority of the Negro and other savage tribes has been grossly exaggerated. Even Darwin was subsequently obliged to reconsider his verdict on the people of Tierra del Fuego. Owing to the praiseworthy efforts of missionaries notable results have already been achieved. This proves that they possess a great capacity for education. The Indians often display great shrewdness and intelligence. Thanks to

20 Schaaffhausen, p. 634.

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Jesuit influence, a new and able nation has sprung up in Paraguay, Colorado and elsewhere.[11] Children educated in Europe easily learn. A return to their old haunts and associates not infrequently causes a relapse. But this only shows that habit is second nature. If we reflect on the length of time that elapsed before ancient civilization attained its intellectual eminence, we shall not expect inferior races to perform impossibilities in a few hundreds of years. All peoples, in their earlier stages, were, in a sense, "savage," as, for example, the universal prevalence of cannibalism proves. Nor is it at all likely that Negroes are still in their childhood; it is quite certain the Americans are not. The Negro's freedom from want, like his laziness and incapacity, now swell the ranks of exploded fables. Negroes belong in part to an older civilization. They are strong and healthy, and their limbs are symmetrical. True, if Egypt be excepted, no proof is to hand that Africa was the home of a higher civilization. But its inhabitants emigrated in ancient times from Asia. Since, therefore, they are not indigenous, it is probable that they, like the Polynesians, once stood on a higher level.

The scanty remnants of the sort of civilization still found among savage races afford evidence, that they shared in the intelligence that was originally the common property of all mankind. Naught but a common origin, or a common and therefore necessary error can explain the substantial agreement that pervades the customs, manners and superstitions of the most widely different peoples. As regards mythology, similar myths may be assumed to indicate similar phases of thought. Still the various customs attending funerals, family life, and the rest can hardly have arisen spontaneously. Among Tartars, Kampschatkans and Sioux Indians a superstition is rife that fire may not be touched, nor a burning coal fetched out of the fire with a knife.[12] The half-insane custom of what is known

11 Hellwald, *Ausland*, 1875, p. 814. Schaaffhausen, p. 229, 366. On the Negroes, see *Münch. Allgem. Zeitung*, 1887, No. 85.

12 Max Müller, *Essays*, vol. ii., 271. Peschel, *Völkerkunde*, p. 227.

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as *La Couvade*, which prevailed extensively in ancient and modern times, can only be accounted for by the idea that repose and quiet are necessary for the child during the time of confinement. This explanation, though sufficient for the educated, would hardly satisfy the savage. We will not dwell on the use of fire, which could hardly have been discovered by each nation separately. But anthropophagy, the universal use of intoxicating drinks, similarity of tastes and habits, of ideas and tendencies, similar tales and legends proclaim that all peoples are knit together with a most indissoluble tie. That which is but prehistoric in the language of Aryan tribes is often actual and historic in that of the Turanian stocks. It is surprising to find Finns and Laplanders, Zulus and Maoris, Shans and Karens deeply in accord with Aryan traditions. The whole world is studded with the same prehistoric antiquities. Everywhere there is the Stone Age and the Bronze Age. Arms, tools and ornaments, tombs and temples everywhere abound. The Old and New Worlds, both past and present, are cumulative evidence that the human race and human civilization had a common origin.[13]

Whence came the tribes that peopled Europe? From modern geography and ethnography it appears extremely probable that Central Asia was their cradle-land; whereas Eastern Asia and the Malay Archipelago were the original home of the inhabitants of Australia, Polynesia and America. The relations between Central Africa and Melanesia also point to a common home. Why the Papuan should resemble the Negro is still a riddle; but as the Australians have affinities with both Mongolian and Caucasian stocks, the presumption distinctly favours a common origin. The Semitic race, as is well known, occupied North Africa. Population spread from one centre. With but few exceptions all the islands of Oceania were discovered uninhabited. Historical traces of the north-east pas-

13 Gloatz, ii., 515, 774. Worsoll, *Stein u. Bronceseit in der alten und neuen Welt*, 1182. Max Müller, vol. ii., 250, 417. Nadaillac, p. 1. *Revue des deux Mondes*, 1884 (t. 66), p. 412 seq. *Controverse*, 1882, p. 762 seq.

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sage to America still remain. The geographical distribution of plants and animals, which points to a distinct home for each, enables us to trace the direction in which the human race spread. Here ethnographers join hands with Darwin, Huxley, Haeckel, Hellwald, Caspari and others, only, however, to part again when the point comes to be more closely defined. On all hands it is agreed that Asia, or its neighbourhood (Lemuria), is the centre whence men went forth to fill the earth. Nor is it a mere empty phrase to say that Asia is the cradle of the human race. Even if prehistoric research succeeded in proving the existence of Tertiary man, the view embodied in this phrase would not cease to be tenable, as immigration would still be probable. But as there are no prehistoric proofs for man's appearance in prehistoric times, all deductions drawn from this hypothesis are merely visionary. Since the autochthonous origin of man and the higher animals is not probable, more caution will be requisite in explaining the few cases that still present any difficulty.

Nevertheless the spread of man, and the spread of animals and plants are not convertible terms, except in the case of the domesticated animals and plants. On this point there will be widely divergent opinions. The same phenomena are met with in places far apart. Thus the tortoise is found in the Galapagos Archipelago, and at the Mauritius; the tapir in the South American Cordilleras and the Indian Archipelago. The Lemuridæ are mingled with other races in Africa, and have blood relations in the Eocene strata of Utah in North America. Fossil remains of anthropoid apes (Laopithecus) have been unearthed both in Europe and America. These can hardly have been indigenous. We can still trace the footprints left by beasts and plants in their sojournings from the mainland. Why should not wind and waves have also promoted their diffusion in ancient times? Climate is no longer the same. Change has been at work on the earth's surface. Still difficulties that may not be passed lightly over bar the way to hasty generalizations. Not the variety of the pres-

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ent continents, but the similarity of the past flora and fauna create the greatest difficulties. An equal temperature reigned almost throughout the Tertiary age. Flora and fauna were everywhere subjected to the same conditions. The Tertiary flora shows traces of plants from all parts of the earth. Its special characteristics are still undefined. It would seem that the seed was equally distributed. For this reason many like Heer,[15] throw their weight in the scale of the radiating theory, which teaches that plants went forth from the poles like rays. Thus development attained its zenith in the Miocene age. Then, as the geological epochs rolled along, owing probably to the upheaval of the mountains, a change in climate took place over a large part of the earth's surface.

The comparative study of language is a safer guide into the realms of intellect. From it we learn of developments that had taken place before history had dawned. Languages are in fact as numerous as independent peoples, and history tells us that language and customs were the great barrier that separated tribe from tribe. Some people have, indeed, changed their language. One original language may not be an absolutely certain proof that the human race is one. Still language is a sure-footed guide, and the original language is at least a negative proof, and affords a strong positive presumption in favour of unity. Whence comes it that languages differ? This question, though scarcely ever broached formerly, seems now to be coming to the front. Outside the Old Testament there is scarcely a record of any nation busying itself with the problem why languages should be many instead of one. Grimm can recall but one Esthnish legend, and Max Müller has raked up two other stories. Such a tradition exists among the Tschinkithians of what used to be Russian America. None of these however, bear a striking resemblance to the Mosaic narrative. But the Indians of Central America have a saying, very much like the words of

15 Probst, *Beschreibung der fossiler Pflanzenreste*, 1884. *Unser Wisen von der Erde*, p. 816, seq. Zacharias, p. 124.

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Scripture, that all men had *one* speech and *one* religion, but that when the town of Tulan *worshipped false gods* their speech was changed.[16]

This vexed problem has been pushed to the front by modern philology. The comparative study of languages brings out in bold relief the peculiarities of kindred languages; but so far its efforts to discover the original tongue have not been crowned with certain success, and the attempt to prove that several original languages existed has resulted in failure still more glaring. The only path to certainty is to trace the various elements of language to their source. For the grades of development are numerous, even in the advanced languages of peoples who are undoubtedly akin. Often expert linguists do not disdain to take refuge in chance. If, however, we bear in mind the modifications to which the Romance languages, or languages derived from the Latin, have been in course of time subjected, we shall not be so much at a loss to understand how the Indo-Germanic languages (Celtic, Teutonic, Roman, Greek, Slavic, and Zend) have been derived from one Aryan stock. Heretofore Sanscrit was thought to be the mother tongue of the Indo-Germanic family; but modern research has shown that Sanscrit is only the eldest sister. Thus the whole Aryan family was at one time united by one common Aryan language and probably led a peaceful life, far away from the sea, at the foot of the Himalayas.[17]

Moreover, the Aryan and Semitic stocks were at one time united. We will not tread debatable ground by insisting on the relationship between Indo-Europeans and Semites on the one hand, and between Australians and Africans[18] on the other. At all events this controversy has shaken the axiom, that from the three-lettered Semitic roots to the two-lettered Indo-Germanic roots no transition

16 Max Müller, vol. 1, 326.
17 Max Müller, II., 17.
18 *Controverse*, 1883, p. 56. Max Müller, *Wissenschaft der Sprache*, i., 237. Tylor, *Anthrop.*, p. 192.

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is possible. The two families of languages flow from the same source, although their forms are different. Originally both had the same material elements; both presuppose a ready-made grammatical system that preceded the division into dialects. The Aryan and the Semitic are, as it were, two streams, and the branches thereof represent the varieties of two specific modes of speech. At an earlier period, owing to political or personal influences, the grammatical elements amalgamated and fused instead of combining in pure agglutinative fashion. This "dialectic age," as it is called, must have been preceded by an age when agglutinative speech was general. This may still be seen in the Turanian languages which holds sway in one form or another from China to the Pyrenees, and from Cape Comorin to Lapland. The family likeness, however, is not strongly marked. So the "keen penetrating eye of "the antiquarian and the philosopher" peers into the dark vista of a "rhematical" age, in which there was no grammar but only the necessary words used in every-day life, such as pronouns, prepositions and numerals. By affixing and inserting particles in the Birmanic, isolated relative expressions became imbedded in the roots. When this method is extended to prepositions, polysynthetic constructions are produced. Thus monosyllabic speech contains the germs of both inflective and agglutinative languages, and is the key that explains the difference between them.[19] Agglutinative languages (Turkish) are not wholly devoid of inflection. Notwithstanding the fixed and conservative character that belongs to national languages, there was a time when every inflected language was agglutinative, and every agglutinative language was monosyllabic. A common origin is certainly compatible with the radical, terminational (agglutinative), and inflective forms. So far unity has not gained much from the latest Assyrian and Chaldaic discoveries; but the bilingual tablets, forming as they do the borderland of the Turanian, Semitic and

19 Gloatz, vol. ii., 793. Max Müller l.c., p. 279. Vigouroux, vol. i., 304. Reuss, p. 37.

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Indo-Germanic languages, hold out a promise of something better. They are supposed to be written either in Accadian or Sumeric; anyhow it is some Turanian language. Thus they form a stepping-stone to the Indo-European. Hence also all linguistic research points to a common agglutinative speech from which the elements of all languages are derived. These elements must have been common to all languages, since no new language has ever been constructed. It is not the words but only the combination of the elements that is new. The subsequent development, however, is often retrogressive, not progressive. From the first the history of the Aryan and Semitic tongues shows more decline than growth. Compared with the Latin, the Romance languages show signs of decomposition and phonetic corruption. The Turanian languages, having no political or national bonds of union, were easily split up into dialects without a grammatical backbone. Certain peculiarities, however, are common to many words with a conventional meaning.

Comparative philology, as such, is not called upon to explain the confusion of tongues. Its attitude towards Holy Scripture is the same as that of Natural Science to Biblical Cosmology,—an attitude that is rather hostile or reserved than friendly. External motives aside, science has a severe and formal method, is guided by exact laws, and swayed by external influences. A miracle has no place in the scientific system. Nor is a miracle necessary as an aid to scientific enquiry, provided the limits of scientific competency are recognized. When Philology has elminated the "mysterious element" from the problem of the original language, the human mind still seems powerless to penetrate it even in its simplest form. In the 11th chapter of Genesis the earth is described as being of one tongue and one speech. When the people removed from the East they came to a plain in the land of Sennaar and dwelt therein. And lest they should be scattered abroad in all lands they desired to build a city and a tower, whereof the top should reach to heaven, in order to make

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their name famous. And the Lord came down to see the city and the tower that the children of Adam were building. And he said : " Behold it is one people and all have one " tongue ; and they have begun to do this ; neither will " they leave off from their designs till they have accom- " plished them indeed. Come ye, therefore, let us go " down and there confound their tongue, that they may " not understand one another's speech." And so the Lord scattered them from that place into all lands. This is the confusion of tongues that was created at the building of the Tower of Babel. God had commanded men to people the earth. Instead of fulfilling God's command men were grouping round one centre, and seeking strength in union. Now, taking the above words in their literal meaning, it is here said that God frustrated the designs of men in a wonderful manner, by confounding their speech, and thus obliging them to separate. Now we cannot conceive this confusion to have been produced by a change in the organs of speech, since these are substantially the same in all men. But the clue must be sought in the connection between reason and language. After the Deluge men began to turn away their minds from God. Their thoughts centred in ambition and self-seeking. And thereby they lost their spiritual centre, their point of unity, which is in God. Now confusion of speech was the outward expression of spiritual disunion. As their minds were unable to understand one another, so they could no longer make their speech understood. Such a sudden change, however, is inconceivable unless God is supposed to have worked miraculously on the mind of man. The tower-builders were punished in that in which they had sinned. They had forsaken God, their spiritual centre, and God completely disunited their minds. To say that the confusion and subsequent division of tongues was brought about merely by an estrangement of hearts, is to unduly strain the words of the text. It is, indeed, said that men were of " one tongue," and not merely of one speech, or that they used similar words. Speech may, indeed, be put for

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discourse or disposition; but still the narrative lays great stress on the fact that men could not understand one another."[20]

The *History* is more difficult than the Exegesis. History relates that people spoke different languages. Now if the Deluge, according to the usual chronology, is placed at 2500, the confusion of languages will fall within historical times. And yet it is historically inexplicable. The date must therefore be put considerably further back. By making the confusion of speech prior to the Deluge, and assigning it to the early days of the human race, the difficulties apparently diminish. But, on the other hand, it is hardly reconcilable with the Scriptural account of the building of the Tower. And, again, the partial character of the Deluge, with regard to mankind, would have to be considerably extended. Reserving for the next chapter our justification for departing from the received biblical chronology, we may say here that we claim both for the Deluge and for the confusion of tongues a higher antiquity than is usually accorded to them. There is, however, no need to fling aside all limits. The documentary evidence does not cover 3000 years. If another thousand years be allowed for the necessary changes to take effect, the departure from the biblical chronology is not excessive, and yet it is sufficient to account for the growth of language. As the Romance languages were evolved from the Latin in a very short time, it seems unnecessary to require long periods for the evolution of the Aryan and Semitic and, indeed, of all language. At this point Comparative Philology has no exact standard to guide it. It cannot define how much time was required for this gradual division and separation. No scholar can say definitely whether Hindus and Greeks, starting from the same point, would require several generations, or hundreds or even thousands of years to make their common language as diversified as

20 Kaulen, *Die Sprachenverwirrung zu Babel*, Mainz, 1861. Strodle, *Die Entstehung der Völker*, Schaaffhausen, 1868. *Natur u. Offenb.* 1874–1877.

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Sanscrit and Homer.[21] One thing, however, is certain; the formation was gradual. God's action was not a sudden revolution, but an impulse produced in man whereby, since his soul was divided, his language was also divided beyond hope of recovery. For it is alike self-evident and historically proved that the several languages were not created perfect. In its main features, its materials and its elements, language is ever the same. The change once begun was rapidly completed in new settlements.

The doctrine that the human race is one has, therefore, both anthropologically and philologically, a high degree of probability in its favour. This is sufficient for the justification of faith. For we cannot hope to clear up all the darkness that has settled over the first beginnings of the human race and human civilization.

21 Max Müller, vol. II., 253. O. Schrader, *Sprachvergleichung und Urgeschichte*, Jena, 1883.

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CHAPTER XVIII.

THE AGE OF THE HUMAN RACE.

Holy Scripture furnishes no dates which enable us to determine the exact age of the human race. In the first place considerable discrepancies have crept into the several texts. Take for instance the period from Adam to the Deluge. According to the usual computation, the original text and the Vulgate make this period cover 1656 years; whereas the Samaritan text assigns 1307 years, and the Septuagint 2242 (2262) to the same interval. From Noe to the birth of Abram the numbers respectively given are 353, 943, 1133. As to the sojourn in Egypt the several texts not only differ from one another, but the same text is at war with itself; the Vulgate fixing its duration at 400 years in Genesis, and 430 in Exodus. Consequently the sum total is also uncertain, and the whole length of time that elapsed between Adam and Christ appears about 4,000 years in the Vulgate and 6,000 in the Septuagint. Corrupt texts are clearly responsible for a great deal of the mischief, as the ancients employed letters of the alphabet for numerical signs. This, however, is not the whole account of the matter, as all the discrepancies are not traceable to this head. The large numbers given in the Septuagint betray too clearly an intention to lengthen the periods, to be accounted for by mere errors in transcription. S. Jerome was so impressed by this fact that, despairing of fixing the chronology of the Old Testament, he abandoned the task to thoughtful men, in order to

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divert his researches into a more profitable channel.[1] Theophilus of Antioch enumerates 5698 years. With modern Jews the year 1887 is the year 5648.

Of the hundred and fifty chronological systems devised by modern archæologists and chronologists to explain biblical chronology not one has found general acceptance. Many incline to follow Jerome's example, and think, since God has allowed such discrepancies to find their way into the texts, that nothing higher than human certitude can be claimed for the chronology of Scripture, which is thus arrayed in the careless attire with which profane science loves to enrobe it. That the sacred writers were wholly indifferent to chronology is a proposition that cannot for one moment be allowed to pass muster, but with the limited resources at their command it was wholly impossible for them to give in every instance the exact date. Revelation on this point forms no part of inspiration.* It is well known how quick the sacred writers were to choose sacred or round numbers. The first kings are said to have reigned forty years, but this number is not in harmony with the dates given. The numbers *three* and *seven* recur at every turn. The Chaldean chronology, it is true, agrees in the main with the Bible. Thus, for example, from Adam to Noe it enumerates ten kings, who correspond to the ten patriarchs[2] of the Bible; but since the ten kings, like the ten patriarchs, must stand for whole generations, the coincidence merely shows that Semitic writers generally are swayed by similar tendencies. To fill up a gap in genealogies sacred writers, like other writers, insert names which make the ages of each, and the length of the period, uncertain. If the chronology be computed in this fashion, Noe would have been alive in the time of Abraham. In

1 Ep. 75, 5. Möhler, *Patrologie*, p. 290.

* This may be granted; but it might be objected that the author's remark does not seem to cover the whole question. For it may still be asked: was it not, at any rate, a part of inspiration to preserve them from mistakes in their dates and numbers? To this the author answers that the sacred writers never *meant* to give perfectly accurate dates.—*Tr.*

2 Vigouroux, *Bible* I., p. 205; iv. p. 24. *Controverse*, Sept. 1886, p. 87. *Kirchenlexicon.* III., p. 310.

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determining, therefore, the age of the human race, we must take the chronology of the sacred writers as our guide, but only for the purpose of fixing the chief landmarks. A great age may with safety be taken for granted; but in defining its extent science is likely to go wider of the mark than the Bible.

Since Holy Scripture nowhere tells the age of the earth, the apologist is not directly called upon to deal with the random calculations of palæontologists. As long as it was customary to interpret the days of creation as ordinary days, the earth and the human race were naturally supposed to be coeval; now, however, that it is fashionable to lengthen the days into periods, or to take them as merely formal determinants, the partnership is dissolved. And yet palæontology has still some voice in the calculations. The swollen figures given by geologists and palæontologists are still pregnant with mischief. Moreover, it should not be forgotten that palæontological explorations brought to light the first traces of man by unearthing human fossil remains, and by giving an insight into prehistoric man's mode of life. Human fossil remains were first discovered at Canstadt in 1701, part of a human skull being found in the clay, imbedded in mammoth remains. In 1774 the cave of Gailenreuth yielded a human jaw-bone and shoulder-blade. In 1835, three human skeletons were discovered in the cave of Enghis on the Meuse, and many others were found in a cave of Enghioul on the opposite bank of the Meuse, with the bones of the mammoth, rhinoceros, great bear, and other such ancient animals as their companions. A skull was found at Neanderthal near Elberfeld in 1856, and the right half of a human lower jaw, with its row of teeth, in the sandpit of Moulin-Quignon, near Abbeville, in 1863. Many other discoveries followed, especially in France. In 1866 the district of Solutré, in the Maçonnais Department, so bristled with discoveries that it was nicknamed the "charnel-house." The position in which the skeletons here discovered lay, indicated that they have been buried. In Germany there were many

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discoveries worthy of mention: the skulls of Lahr and Eggisheim which, together with that of Neanderthal, carry us back to the time of the mammoth and the bear; the skull of Stettin on the Lahr, and of Höchal near Frankfort (dolichocephali); skeletons from Mecklenburg-Schwerin; bones from the caves of Schillerhöhle, Erpfing-Höhle, Hölerfels near Blaubeuren, Ofnet near Utzmemmingen, and Moor near Schussenried. Nor are other countries behind in the race. All these discoveries are supposed to form a cumulative argument that man inhabited Europe at a time when the cave-bear and the great feline species represented the great carnivorous animals, and the mammoth and the rhinoceros the pachyderms.[3] But—accepting as a starting-point the one admissible distinction of the Stone Age—these animals belong to the palæolithic period. Of course it cannot be concluded with absolute certainty that primitive man lived on the earth with these animals, but the bone implements seem to suggest that man killed these animals for food. All the remains, it is quite clear, cannot be referred to this distant date. The age of the Canstadt skulls is still a bone of contention. Then, again, the bones, in many instances, have not the characteristics of great age. A more recent date is rendered highly probable, owing to volcanic agency e.g. at Le Puy in the Department of Loire, and Calaveros in California, for these volcanoes were active in the fifth century of our era. Still, all this notwithstanding, we have to face the probability that man and beasts were contemporaries. And now another difficulty looms in sight: to determine the period at which these animals of the Lower Quaternary Epoch (Diluvial) lived. It is all very well to invoke the aid of a higher temperature, to appeal to the beginning of the Ice-Age, and so forth; but these climatic conditions set up only a relative standard of measurement. Eminent geologists, like Pfaff and Graas, have declared with unmistakable emphasis, that man did not appear on

3 Nadaillac, *Die Ersten Menschen*, p. 160. *Unser Weissen*, p. 587, Quenstedt is more cautious: *Epochen*, p. 762, 783.

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the scene till after the Ice-Age. The Ice-Age and the Quaternary Epoch coincide in their beginnings, and man must certainly be referred to the second glacial Epoch. It has still to be ascertained whether there have been one or more Ice-ages. Now historical proof is forthcoming that the temperature has been on the increase in many countries since the days of Herodotus, and that the glaciers generally have receded. Hence there is no necessity to suppose that glacial man has been in existence for an immense number of years.[4] When the fact is grasped, that within the last hundred years several species of animals have perished in Australia, and that the buffalo and the auerochs are even now on the point of dying out, it will be more clearly understood how, in an earlier age, when no quarter was given, sets of fauna were, owing to climatic action, completely swept away.

So far the Tertiary epoch has been sterile in fossil bones. Of no single bone that has been found can it be predicated with certainty that it is of the same age as the tertiary deposits from which it was taken.[5] Other footprints of Tertiary man have proved equally illusory. The Abbé Bourgeois set the ball rolling by labelling the many flints he had found in Thenay as the workmanship of Tertiary man. At first he succeeded in enlisting several men of science on his side; but the matter, on investigation, became so thickly enveloped in the mists of doubt that it vanished at last in utter improbability. The reputed works of art, with indented surfaces, are much liker shapeless works of nature. Again, other flints, lances, arrowheads, spears and such like found in St. Prest, probably belong to a later formation. To determine the age of objects found in mud or sand deposits is most difficult, as these may easily have been buried subsequently at a greater depth. In like manner man's handiwork in conjunction with natural causes may have shifted the deposit. Moreover no standard is to hand for gauging the time of the

4 *Controverse*, 1886, Nov., p. 340, seq.

5 Nadaillac, p. 158, 513. Schaafhausen, p. 154. *Unser Wissen*, p. 586.

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deposits in the several periods. Recent researches, even in the much belauded Somme Valley, have shown that the layers of sand were formed in historic times.[6] Furthermore, it was alleged that *drawings*, which none but the hand of man can execute, adorned the bones of some Tertiary animals. Bones, too, had been produced which had been fractured, so it was said, by the hand of man. Coloured impressions were also said to be distinctly perceptible on the bones of a petrified Hipparion recently discovered in Greece.[7] How transparently fragile these reasonings are, he who runs may read. On enquiry it turns out that the holes and indentures were made by contemporary animals. Many of the alleged marks and drawings are accidental chinks wrought by mechanical causes.

These remarks bear also on other remains of human life and industry found in the lower strata. Heaps of refuse, mussels, crabshells, bones, pots, and stone implements have been found in every country and on every coast. The edible mussels, oysters and snails cannot be a natural deposit, but are a heap of the refuse of man's meals, whence they are called kitchen-refuse or *Kjökkenmöddings* (in Denmark *Steenstrup*). This opinion is borne out also by the remains of ashes, coals and wood (beech, oak, pine) with which they are mingled, and by the fire-places that have been discovered. But it is unsafe to assume that these were contemporary deposits, and unsafer still to compute their age. The deposits in the deltas proceed at a slow rate, but historical times can point to a great change. The configuration of lands and continents is other than it was. Elevations and depressions, upheavals and subsidences have likewise had their share in effecting the change. Alluvial deposits, peat formations and stalagmites often attain a considerable thickness, but, as is well known, such formations are most irregular. The sur-

6 Bourgeois, *Revue des Questions Scientifiques*, Louvain, 1887. *Controverse*, 1882, Nos. 50 and 52, and 1886, p. 169. Nadaillac, p. 468, 508.

7 See Humboldt, 1885, p. 363. Nadaillac, p. 501. Concerning Schussenried and Ofnet, see *Württemb. Jahreshefte*, 1866, 1877. *Controverse*, 1886, p. 515.

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roundings of the Quaternary epoch were totally different from ours; the causes at work to transform the earth's surface throbbed with such fierce abnormal intensity, that their duration cannot be measured by their results. Compared with the thickness of the deposits, their duration must have been short. On this point geologists are agreed. So far the assumption of vast numbers of years lacks confirmatory evidence.

As recently as 1854, first in Lake Zürich, then in Neustadt, Constance and some other Swiss Lakes, then again in Schussenried, in North Germany, Austria, Italy, France, England and other countries, palings were discovered which proved to be the remains of lake dwellings, and which had been set up as a protection against wild beasts. Three hundred have been found in Switzerland alone. At first the discovery created universal astonishment, and the wildest conjectures were hazarded as to the age of the human race. Now the palings are regarded as evidence of the slender antiquity of the builders. For it has transpired that pile-builders dwelt near most lakes, even in historic times. Readers of Herodotus will recall the story of the Pannonians on Lake Prasias. Hippocrates speaks of pile villages on the Phasis, at the foot of the Caucasus. Similar erections have greeted the eyes of modern travellers in Celebes, New Guinea, Java, Ceram, Mindanao, the Caroline Islands and elsewhere. The Schussenried pile-builders belonged to the Stone Age, and were chiefly famous for their pottery. Their flint implements betray a certain amount of skill, but they are far inferior to those found in Denmark, Belgium and England.

Tertiary man being thus put out of court, all the more efforts were made to gather the age of Quaternary man from the gradual formations of the earth in which the remnants of his art lay buried. For this purpose the material out of which the arms and implements are made, and the condition in which they were found have been pressed into service. Hence three ages have been distinguished: The *Stone* Age, the *Bronze* Age, and the *Iron* Age. This

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division, though correct in the main, sets up a merely relative standard, admitting of many exceptions, which varied according to circumstances. As already stated, these three Ages are mentioned in Holy Scripture. Now it is allowed on all hands that the Stone Age was the cradle of the earliest civilization. In days gone by, flints, thunder-bolts and meteorites were supposed to be wrought by superhuman agency; but in the days of Mercati (b. 1593), private physician to Clement VIII., they began to be considered the arms of antediluvian man, to whom the metals were unknown. Latterly the search for stone implements has become a craze. Natural products have been mistaken for works of art, and, what is worse, regular stone beds have been quarried for flint implements.* Meanwhile we may in general divide the palæolithic from the neolithic period. The former is the age of the cave-dwellers, when the stone arms and implements consisted of simple splints and roughly-hewn lumps. The neolithic is the age of the valley-dwellers. The cave-bear and the mammoth had disappeared; the reindeer had found its way into the north, and the antelope into the east of Europe; the ice-age was past, and domestic animals had gladdened the scene. This age has yielded polished axes of hard stone, beautifully and delicately carved, and as artistic as a nineteenth century workman can produce with the aid of all his modern appliances. Neolithic man built the dolmens and menhirs; netting and weaving were familiar to him; the tenements he erected were as solid as circumstances required, and the sites he chose were more secure and protected. To fix a limit to the Stone Age is no easy task. The Guanches of the Canary Islands, the Hottentots and others in various parts of the globe, are even yet in their Stone Age. The Mexicans at the time of the Conquest were accustomed to slay the men they offered in sacrifice with stone knives. To this day such knives are used for shaving. Even civilized nations

* Mure de Barrez apud Aveyron.

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retained stone instruments, in their religious rites, long after they had become acquainted with the metals. The Jews used a stone knife for circumcision, and the priests of Cybele for self-mutilation. The Italians employed stone instruments in the worship of Jupiter Latiaris, in the fetial rites, and in solemn sacrifices. Even now the wand of the Albanian augur is of stone. The ancient Egyptians used stone knives in the process of embalming. On the battle-field of Alesia, where Cæsar conquered Vercingetorix, there were found arms of stone, of bronze, and of iron. The English carried stone arms at the battle of Hastings (1066), and the Scots in 1298. Heavy stone hammers were, till quite recently, in use in Irish smithies. In Japan the Stone and Bronze Ages lasted till the nineteenth century.

These facts will suffice to show how difficult it is to say definitely when the Stone Age ended and the Bronze began. Some go so far as to say that it would have been next to impossible to produce bronze implements without iron tools. Anyhow a wide margin must be given also to these ages. We assume that iron was known in Egypt four thousand years before our era; but it was not known in Scandinavia before the Christian era, and in Gaul only eight hundred years before. It is also very probable that iron was wholly unknown in America until Columbus' discovery. This is all that need be said on the boundaries of the Bronze Age, that is, as far as the unreliable data warrant any conjecture at all. Of the Swiss pile-builders some, like those at Schussenried, go back as far as the neolithic period, although their villages continued to be inhabited throughout the Bronze Age, while others lived in the Iron Age, and even in historic times. Thus the three-period theory does not always work. For what is successive in theory is often contemporaneous in fact. It sets up an essentially relative standard, and in many cases we await further information. If six or eight thousand years be fixed as the maximum, there will be ample scope for the widest speculation.

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Philology and ethnography furnish, on the whole, far safer data for determining the age of the human race. Although particular cases are attended with special difficulty, a relative limit may be fixed. The history of ancient civilized nations is far-reaching, and their language refined. Whether we contemplate Egyptian civilization, or feast our minds on the history and literature of the Indians, we cannot but marvel at the intellectual eminence to which these ancient nations attained. The pyramids alone bear witness to such a high theoretical and practical knowledge of art, that its development must have occupied several thousand years. The theory that it was imported from Paradise seems to us to exaggerate the purpose and sphere of that state of primitive happiness. Here, again, the secular sphere must be marked off from the religious and moral. The refined written language, which the Egyptians possessed three or four thousand years before Christ, presupposes much study, thought, and observation, and a people whose minds had been trained to unravel the subtlest phases and combinations of thought. In defining Manetho's dynasties, Egyptologists hesitate between the years 6117 and 2182 B.C. The latest date at which the Egyptian kingdom began is given by Lepsius as 3892, by Lauth as 4157, by Brugsch as 4455, and by Mariette as 5004. Unquestionably the greater pyramids are not later than the year 3000. Now it is precisely the history best known to us, viz., that of Egypt, that compels us to assign a more remote date for the beginning of the human race than that hitherto received. The history of the Indo-Europeans also carries us back to a time, when the several stocks of the Aryan family lived in the Himalayas as one people. Of this, history tells us nothing, but philology steps forward and submits to our gaze a highly cultivated language. Although written documents reach no further back than 1400 B.C., still a long tradition must necessarily have preceded. Fabulous as are the statements of the Chinese regarding their ancient history, critics are still obliged to allow them a comparatively high antiquity.

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Nevertheless there can be no question of absolutely fixing the time.

In dealing with history and philology, no less than with geology, we must take care not to lose our heads over big figures. All apologists of note now agree in allowing that the antiquity of the human race is somewhat greater than it had been commonly supposed. The lowest estimate varies between 8,000 and 10,000 years, but even the highest is not double the Septuagint computation.

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CHAPTER XIX.

THE DELUGE.

The sixth, seventh, and eighth chapters of Genesis are occupied with the story of the great Flood which destroyed the whole human race, save only eight souls in Noe's family. The Flood, which is described as overtopping the highest mountains, is made to appear as an extraordinary manifestation of God's vengeance on the human race for its wickedness. The account is in some respects peculiar. It is surprisingly diffuse, and abounds in repetitions,—the same fact being stated and restated in different words. In chapter vi. God's action is declared to be due to the universal wickedness of mankind, and Noe and his family are said to be spared in reward of their righteous conduct in the midst of universal corruption. Then Noe is charged to build the ark, and to take into it two animals of each kind. In chapter vii. Noe is ordered to enter the ark, and to take therein seven pairs of clean and two of unclean beasts, and also of the fowls of the air, seven and seven, male and female. The execution of the order is then related, and it is noteworthy that two pairs of both clean and unclean animals entered the ark. This fact of the animals and Noe entering the ark is again mentioned when the Flood burst forth. That this is an additional narrative, such as was usual with Semitic writers, appears from the use of the Pluperfect. At length the waters of the swollen Flood rose to their full height, overtopping the highest mountains by fifteen yards, and de-

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stroying all living creatures under heaven. In forty days the Flood reached its height, and for one hundred and fifty days it so stood. Chapter viii. describes the end of the flood. One hundred and fifty days after the Flood began, the ark rested on Mt. Ararat, and seventy-three days later the tops of the mountains came in sight. Forty days after, Noe sent forth a raven, and on every seventh day he thrice sent forth a dove. On removing the covering from the ark, he saw that the surface of the earth was drying; but fifty-seven days more elapsed before it was quite dry. At length God bade him quit the ark, in which he had abode one year and ten days,—whether a solar or lunar year is not clear, but probably, according to the latest Hebrew calculations, the latter. Absolute accuracy in regard to numbers is hardly possible.

Why, it will be asked, is the story told with such circumstantial details, and with such laboured chronological precision? The answer must be sought in part in the purpose for which the narrative was written, and in part in the sources of information that Moses had at his command. Moses intended to give a vivid picture of the greatest catastrophe that had ever burst upon the living creation, and to old up *in terrorem*, before the eyes of the people, the heavy chastisement which God once inflicted upon the sins of mankind. In regard to the sources, a theory has recently been built on internal grounds, that two distinct sources at least are clearly discernible, which were not made into a consecutive narrative till a later date. The chief argument on which this theory rests is the change in the names for God. Thus the name Jahve is used in chapter vi. as far as verse 8, but Elohim is introduced with the history of Noe, and is retained throughout the chapter. In chapter vii. Jahve is used till v. 9, and Elohim from v. 11 to v. 16; in v. 16 both Jahve and Elohim occur. Elohim reappears in chapter viii. (1–15), but is interchanged with Jahve in v. 20. As the narrative proceeds, the respective characteristics of the two documents are disclosed. Thus in the Elohistic, *ego* is used with *ani* (v. 17), in the Jahvistic

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with *anoki* (vii. 4). Hence, it is said, the narrative in chapter VII. (1–5) is parallel to that of the Elohist in chapter VI. (13–22). In like manner chapter IX. (1–17) is merely a prolix Elohistic version of chapter VII. (20–22). The contradiction between c. VI. (19–20), and c. VII. (23), and between c. VII. 12, and VII. 24, is accounted for by supposing that the two documents tell a different story.

The Divine names are interchanged throughout Genesis. By way of explanation it may be affirmed generally that Elohim mirrors forth God as the Almighty Creator and Lord of the world, while Jahve pictures him as the God of the covenant. Thus Elohim is used in chapters VI. and VIII., because the beginning and end of the catastrophe give special prominence to God's omnipotence, whereas Jahve is most appropriate to c. VII. which deals with the salvation of Noe, from whose family the future race, the people of the covenant, was to spring. Consequently the distinction between clean and unclean animals, which was uncalled for in c. VI. 19, is laid down in c. VIII. 2. Similarly more precise orders are given about the birds in c. VII. 3, because clean beasts and birds are declared to be fit for sacrifice (c. VIII. 20). Hence Noe was ordered to take a larger number of the clean kind into the ark. Jahve reappears at the sacrifices in v. 21. Both reasons go hand in hand. The compiler must have proceeded with the utmost wariness and circumspection, as the result cannot be due to chance. Chapter VII. 16 is a case in point. Elohim gives Noe the command, and Jahve closes the door of the ark. It is hardly conceivable that the compiler set the two names side by side accidentally, and for no other reason except that they were in the sources whence he drew. Nevertheless we are not concerned to take up an uncompromising attitude, and to contend *à outrance* that Genesis is not based on any older source, written or oral. The pertinent question, however, is whether they were known to Moses, and whether the accounts destroy, or complete and sustain each other. These internal reasons,

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since they are liable to many exceptions and often cut both ways, will never give any decisive result.

Fortunately, as in the case of creation and the fall, we possess, independently of the Bible, an account of the Deluge in the cuneiform inscriptions, which sheds a flood of light on Genesis. The clay tablets are, it is true, only copies from the seventh century, B.C.; but the originals are pronounced by competent critics to be as old as the year 2000 B.C.[1] The two accounts are of such a kind that they must have been drawn from different sources. In the Chaldean story, which Abraham had brought with him from his own home, Noe is wrongly represented to have been near the sea (Persian Gulf), whereas Genesis and the "Ark" presuppose the mainland. The Chaldean also would seem to have been conversant with two narratives; for he records the two episodes in Gen. VII. 16, with this difference, that it is Hasisadra and not God who shuts the door of the ark (ship). The Chaldean legend also bears traces of the two passages at the end of c. VIII. and the beginning of c. IX. It also tells how Hasisadra, after landing from the ship, offered acceptable sacrifices to the gods; wherefore they loaded him with favours. Here, then, are the Elohistic passages on the beginning and end of the catastrophe, and the Jahvistic passages in regard to the animals and the offering of sacrifice. Nor is mention wanting of the three birds sent out in succession. External confirmation such as this is more valuable than myriads of internal arguments, and shows conclusively that the story told in Genesis is not a subsequent fortuitous compilation from unknown documents. Moses learnt the points of the story, and handed them on intact and unaltered. In reading the biblical story we are struck, not by the blending into one of two narratives, but by the lofty design, the moral teleology that pervades it. In this, indeed, the finger of God is manifest.

1 George Smith. See *Zeitschrift für Kath. Theologie*, 1877, p. 128; 1815, p. 624. Vigouroux, *Die Bibel*, 210. E. Schrader, *Die Keilinschriften und das Alte Testament*. 2 ed. Giessen, 1883, p. 46.

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Other traditions concerning the Flood need not now occupy our attention. They are to be found in almost all nations. The tradition concerning the Flood, says Lenormant, is the universal tradition *par excellence* among all nations that have preserved the memory of the history of primitive man.[2] In these sagas, however, the Flood loses for the most part its penal character; and in this is seen their inferiority to the Mosaic narrative. The Chaldeans conceive the Flood as resulting from the battle of the gods, and fail to recognize that moral purification was its purpose. Greeks and Indians have forgotten that the Flood was a chastisement. The Avesta says nothing of the Flood; but as the Zend is closely connected with Sanscrit and the Veda, this ignorance can only be accidental. The story of the Flood is known also to the Iranians. In the Rig-veda the Flood has left no trace, but it is once mentioned in one of the later Brahmanas; whence the surmise that the Indians borrowed it from their Semitic neighbours. So far, however, no proof of its Semitic origin is forthcoming.[3] The Chinese story agrees in chronology with the supposed biblical chronology in assigning the Flood to the year 2597. Despite its many fanciful details, the Greek story of Deucalion, as told by Ovid, approximates very nearly to the Bible. In the New World the Flood Saga found a home in Mexico and Peru. Egypt is the only country in which all memory of the Flood seems to have completely died out, for the simple reason that to the inhabitants of the Nile country the Flood must ever seem not a curse but a blessing. In earlier times, if we are to believe an inscription, there was a vague remembrance that the gods had once destroyed the human race. More than this is very doubtful, for subsequent confirmation is of little value in tracing ancient Egyptian history. Whether the Flood is known to the African tribes is still in dispute. From recent researches it would seem likely

2 Apud Vigouroux, l.c. See Lücken, *Die Traditionen des Menschengeschlechtes*, Münster, 1869. Fischer, *Heidenthum und Offenbarung*, Mainz, 1828, p. 218, seq. Schäfer, *Das Diluvium in der Tradition der Völker*, Frankfurt, 1888.

3 M. Müller, *Essays*, I., 148. Vigouroux, I., 212, seq., 238.

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that the story had penetrated into the African continent and Madagascar.[4] Even Australia has nursed the tradition,—a fact which may tell in favour of the antiquity of the African legend. Still it most probably originated with Islam or Christianity,—the balance of probability being in favour of this assumption, since no traces are found before the Blacks came in contact with other nations. So far all the sagas agree in the main with the Bible: man was saved in a tub or ship; the animals were saved; the tub landed on a high mountain; but the moral purpose recedes into the background, and the war of the gods throws everything into confusion.

Genesis nowhere states directly the time at which the Flood broke over the world, unless the remark that Noe was then six hundred years old be taken as such. This tallies with the age of the patriarchs given in Genesis, but it cannot serve as a basis on which to fix the exact date, since the age of the person and the generation are mingled in one without distinction. The year 2,500 or 2,600 would be the approximate relative date. According to Gen. vii., 11 and viii., 13 the Deluge began in the autumn, in October or November, for the civil not the ecclesiastical year is meant. With the exception of the Chinese Saga, all non-biblical accounts relegate the Flood to a hoary antiquity, concerning which we are without information. With the Flood history and civilization take their rise. This fact alone would place the Flood several thousand years earlier than is usually supposed. Many difficulties on this head would disappear, if only we might assume that the Flood had not extended to the whole human race, because it could then also be assumed that the development of peoples had proceeded without interruption from one centre.

Apart from this, however, there still remain data for the age of the human race, on which to build a calculation. According to these data man belongs to the Quaternary epoch; but from this it by no means follows that the

4 Gloatz, *Speculative Theologie*, 289, 549, 681.

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Quaternary epoch is the outcome of the Deluge.[5] Such an assumption would be tantamount to a denial of the Ice-Age. Though there are many points concerning the Ice-Age which science has not yet cleared up, as, for instance, whether there was one Ice-Age or several, whether the ice covered the two hemispheres simultaneously or successively, whether the last Ice-Age saw the beginning of the human race, or whether palæolithic man preceded it, one thing at any rate is quite clear. The equable semi-tropical temperature that prevailed in the Tertiary period was violently disturbed, and was forced to give place to cold; and consequently the climate in various zones and lands underwent a change. But in explaining the fact geologists are divided into two camps. With the majority a cosmic explanation finds most favour.[6] The phenomenon, they say, is owing to the variable position of the vernal point on the earth's orbit, in conjunction with the variable eccentricity of the orbit itself. The vernal point completes its course of retrogressive motion in 21,000 years. And thus the perihelion falls successively into four quadrants, which answer to the four seasons. And as it now falls on December 31st, the winter quarter is shorter than the summer quarter (June to August) by five days. In times gone by, too, the eccentricity of the orbit was greater. From this we might expect the Ice-Age to return in both hemispheres, in every period of 11,000 years. The last occurred from 7,000 to 11,000 years ago, and was most intense 9,000 years ago. As the whole duration $\frac{21000}{4}$ would be 5,250, it ended in 4,480. This would be the beginning of the human race.

The cosmic explanation of the Ice-Age in this form is not generally received; nay, it is utterly impossible. Geology insists that the Ice-Age is older. Nor does this view of the platonic year satisfy the astronomer. For the sun's heat was less at that time, because it travelled beyond the

5 Gainet, *Déluge de Noé et le terrain Quaternaire des Géologues*, Besançon, 1883. *Bibliographie Catholique*, Paris, 1884, p. 466.

6 *Natur und Offenbarung*, 1886, p. 263 seq.

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orbit of Mercury. When the earth's warmth was gradually being exhausted, the sun came to the rescue, and then only was it possible for ice to form at the Poles. In this way it will be possible to admit before millions of years a geocosmic Ice-Age, either at the end of the Tertiary epoch, or during the Deluge, that shall not block the way to a later astronomical one. But really these divisions are too ingenious. How have these slight displacements succeeded in producing such mighty changes? All the evidence points to a great Ice-Age, covering with its incrustations a great part of the mainland, and leaving its detritus and stray blocks all around. The physical conditions of the earth, and the vertical structure of the mainland were probably the causes that brought about this Ice-Age.[7] In accordance with what has been said before, this would necessitate an earlier date for the Deluge. Only, be it once more noted, the changes of the Quaternary epoch are not to be measured by the standard of to-day. Moreover, the question still remains, whether the ice was forming everywhere at once. Anyhow, owing to the elevation of mountains, it gradually spread over a wider area. Falb, who explains earthquakes by the theory of ebb and flow, has quite recently calculated that the Deluge took place in 4100 B.C.

The question as to the universality of the deluge may be regarded from three points of view: in relation to the earth, to animals, and to man. Nowadays there can be no manner of doubt that the Flood did not overspread the whole earth. This old view now numbers adherents only among those who wilfully shut their eyes to all collateral knowledge, and blindly put their trust in the literal sense of the text (Keil, Lamy). An inundation of the whole earth to the tops of the highest mountains would require a volume of water so immense as to defy calculation. First of all, imagine a zone of nine or ten thousand metres in diameter girding the earth; then compare it with the sea,

7 Probst, *Natürl. Warmwasserheizung als Princip der klimatischen Zustände der geolog. Formatonen*, Frankfurt, 1884.

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which has a mean depth of from two to three thousand metres; this will give some idea of the mass and weight of water required. It would require some 20 figures to express the number of cubic metres. This mass would have collected as quickly as it dispersed. To exclude the high peaks of the Himalayas and Cordilleras because, being covered with eternal snow, they could afford no shelter to the animals, is to abandon the letter, and to concede in principle the right to explain the text otherwise. The physical difficulties involved in a partial inundation that covered Mt. Ararat, a height of 5,000 metres (if this mount, and not the whole mountain chain, may be exegetically considered the resting place of the ark), are, considering the configuration of Central Asia, far less than for the inundation of the whole earth. Modern palæontology supplies many instances of the sea covering mountain ranges, and depositing animal remains at the height of 4,000 or 5,000 metres. Hence a partial Flood presents no physical difficulties.

By the story as told in Genesis we are not irredeemably pledged to this universality. The waters, it is said, inundated the earth, destroyed all things on the earth's surface, and submerged all the high mountains under heaven. But it argues a very imperfect understanding of the manner of speech adopted in Holy Scripture, to imagine that the sense is bounded by the letter. Naturally this interpretation was upheld until the catastrophe was looked at from its physical side. But once the question is viewed from a scientific standpoint, it becomes imperatively necessary to examine how far this explanation is a necessity. A little study of Holy Scripture soon makes it clear that the sacred writers understood by "the earth," "the whole earth," the country in which they or their informants happened to be.* Palestine is the whole earth, and Jerusalem the centre of the world. Semitic writers delight in rhetorical generalizations,† in magnifying the part into the whole.

* Deut. ii. 35; iv. 19.

† Gen. xli., 54, 57; III. Kings x., 23, 24. See Matth. xii., 42; Is. xiv, 7, 26; Jerem. iv., 23 seq.; xv., 10; Matthew xxvii., 45; Acts ii., 5.

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Many is put for *all*, *all* stands for *many*. From the informant's standpoint all seemed inundated; and we are perfectly justified in viewing these expressions from his standpoint. Nor do we thereby detract from God's wonderful work. For the waters of the deep, and the floodgates of heaven (*i.e.*, the waters of the ocean, on which the land rested, from the earth's cavities, and from the clouds above) form so immense a volume that their aggregation for the purpose of inundation cannot have been a mere natural event, even if terrific water-spouts and tempests, with earthquakes and volcanic phenomena to boot, be dragged in as auxiliary forces.

From the Chaldean story, which makes the Persian gulf the scene of the Flood, it has been argued that a local earthquake, with a whirlwind at its back, was the primary cause of the inundation of Mesopotamia. That the waters have burst forth from the deep is a well authenticated fact, and the alluvial land of the Euphrates and Tigris is favourable to such an outburst.[8] Still, this would not account for a flood so violent and so prolonged, even in the valley of the Euphrates, to say nothing of the whole mountainous tract. The story, for the most part, would have to be relegated to the domain of fable. Perhaps we may infer that the narrator sought, by introducing these events, to impart life and colour to his picture of this extraordinary occurrence. The same thing is observable in the Chaldean story, especially in the substitution of a ship for an ark, which has its sides coated with bitumen, and is entrusted to a pilot. Moses, to whom an Egyptian education had imparted some knowledge of shipping, did not allow himself to be beguiled into thus colouring the authentic story. Hence his narrative is of a more genuine and faithful stamp. In the physical explanation the disturbances that are known to have convulsed sea and land should be taken into account; nor should it be forgotten that the changes in climate and in the configuration of the earth's surface

8 Günther, *Geophysik*, vol. I., p. 379. Stuttgart, 1884. See Pfaff, p. 750.

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during the Quaternary epoch were considerable. As the idea of water newly created, and afterwards annihilated, is not to be entertained, so neither is it possible to harmonize the narrative without the intervention of the first cause. The rainbow did not appear for the first time after the Flood, but it was then set by God as a sign that He would never again destroy the world with a Flood.

How does the case stand in regard to the animals? As to their fate the Bible seems to leave no loophole for doubt. God had set Himself to make an end of all flesh under heaven, in which breathed the breath of life. All on earth were to perish. Of beasts, and birds and creeping things only two of each kind were to be saved. Noe did God's bidding. The Flood came, and birds, beasts and cattle and all creeping things,—all flesh that moved on the earth, was destroyed. The breath of life became extinct in all the living creatures of earth. The writer never wearies of emphasizing over and over again the universality of the destruction, in order thereby to bring out more clearly the universal character of the chastisement. If this *tendency* renders it proportionately difficult to challenge the universality, still on the other hand it will suffice to explain the choice of words. There can hardly be a doubt that the animals alluded to are those only which were known to Noe, and dwelt in Noe's land. Thus the writer adopted the standpoint of the eye-witness, Noe.

Unless this view be admitted, the consequences must be faced. In the Tertiary epoch, it is a certain fact that numerous animals, great and small, filled the earth. In the time of the great mammals animal development had attained its zenith. Palæontological discoveries lead us to believe that the number of animals was immense. We are playing with edged tools by trying to beat down the number on the plea that science, being in the dark as to the formation of species, is utterly incompetent to say from how many pairs the species at present existing have been derived. The Darwinians allow that the Tertiary

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epoch is rich in fàuna, which bear a great resemblance to the present animal world. Geologists, like Pfaff, state very decisively that, in the hypothesis, 2,000 species of mammals, and 6,500 species of birds must have entered Noe's ark. This estimate, far from being the "ridiculous absurdity" Keil is pleased to style it, is well within the mark. It is sheer folly, in a mistaken and misapplied zeal for exegesis, to shut one's eyes to such palpable facts, and then to invoke Darwinism, which is otherwise held up to discredit, in behalf of the fewness of species. How was it possible to procure one pair of each species? Augustine, indeed, has remarked that the animals, following a divine impulse, came of their own accord. From the ends of the earth? Augustine, as we all know, did not admit the existence of the antipodes. Then, again, the Bible says that Noe was to take one pair of each kind into the ark. Going in, consequently, does not preclude being led in. We may, however, reasonably explain by natural instinct the flocking together of the animals of that country to the place where the ark stood. Scenting danger from afar, they fled whither they hoped to find shelter. Supposing, however, that one pair of all these animals had travelled from the ends of the earth, what must have been the dimensions of the ark that was to hold them all! Its size cannot be absolutely determined, as the exact measurement of the cubit is not known; but it was certainly considerable. Still any conceivable dimensions would be childish if room had to be found for all the great graminvorous and carnivorous animals, for domestic animals and beasts of prey. How could they be stowed away together? It answers still less to suppose they were separated, by putting an artificial gloss on certain phrases. How were the animals to be fed? Where was the food to be stowed away? Think of the quantities of vegetables devoured by the ungulates! of flesh devoured by the beasts of prey! To suppose that the animals, while in the ark, abstained from food and propagation is a triumph of ingenious credulity over common sense.

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A comparison of the wording of God's declaration, of the execution, and of its fulfilment reveals a variety of expression. The decree of death is issued against all flesh; all flesh is said to have perished, and yet one pair of each kind is saved. The enumeration of the animals varies considerably, and does not justify us in assuming that a special distinction was always intended. Here, too, the ever-recurring distinction between prophecy and history holds good. Prophecy deals largely in hyperboles; history, careful not to construe hyperboles into facts, shapes itself accordingly. Hence, as S. Augustine says,[9] Holy Scripture usually puts the part for the whole. Other Fathers express themselves in like manner. No cogent exegetical reason, therefore, debars us from explaining the Flood in a partial sense. On the other hand, many parallel expressions in Holy Scripture favour this view, which renders the Flood simple and intelligible. We may go further and say that it is the only view which makes it intelligible. But is not the whole history of exegesis arrayed against it? Till the seventeenth century, it is true, the Fathers and theologians were almost unanimous in explaining the Deluge as universal; and for obvious reasons. The Fathers, being acquainted with only a small portion of the earth, hardly perceived the bearings of their own explanation. Science had not yet probed the earth's depths to learn its antecedents. Opinions differed even as to its spherical shape. The antipodes did not square with the views then in vogue. So it is not to be wondered at if the Fathers interpreted the story of the Flood literally. But it is quite unjustifiable to consider such a *consensus* in matters not appertaining to faith, but depending on human science alone, as an infallible utterance of the Church. As a rule, when the Church has given no formal decision, such a claim has no *locus standi*. Science is in its place in

9 In Ps. 77 and ep. ad Paulin. 149. De civit. Dei 15, 27. See also Pseudo-Justin, *Quaestiones ad Orthod.* 34. For the historical survey, see Reusch, *Bibel und Natur*, 3rd edit., p. 291. Diestel, *Geschichte der Auslegung*, p. 483 seq. Schäfer, *Das Diluvium der Bibel*. Güttler., p. 253 seq.

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investigating how a given result of exegesis bears on faith and morals. If Vossius' work *De Ætate Mundi* was and still is on the Index, it may be safely asserted that its restriction of the Deluge to countries inhabited was not its only fault. The experience gained by Theology in rubbing against Copernicanism should prove a salutary warning, and serve as a reminder that even the Congregation of the Index is not infallible.

A less confident tone is perhaps becoming in discussing the partial character of the Flood in its effects on the human race. Genesis declares over and over again that the eight souls in Noe's family were alone saved. The Legends, too, attest its universality. The Fijians[10] have a tradition that eight, the Aztecs, that one or two survived. Deucalion and Pyrrha, according to the Greek tradition, Manu according to the Indian, were the sole survivors. The very claim of being autochthonous implies this version. Is it, then, permissible to look at this part of the story from the narrow standpoint of the eye-witness, which the narrator has made his own? From the partial destruction of the brute creation, may we infer a partial destruction of the human race? It seems to be a natural inference, since the animals were punished on man's account. Such a solution would greatly simplify the difficulties, on which we have already touched, as to the unity and age of the human race. The absence of all tradition in Africa concerning the Flood seems to give strength to this supposition.

Early this century the theory was mooted that, even if the deluge were universal, there might have been several vantage-grounds on which men were saved.[11] Still more recently ethnographers, philologists, and palæontologists have advanced reasons for a limitation. Schöbel, Omalius, d'Halloy, Quatrefages, Lenormant, Jean d'Estienne,[12]

10 Gloatz ii., 1010. Lucien Biart, *Les Aztèques, histoire, moeurs, coutumes*, Paris, 1886. *La Science*, 1886, p. 124. I.P.

11 Dursch, *Le Déluge de Moïse*, Ehingen, 1829.

12 *Controv.* 1881, p. 2, 9, 10; 1883, p. 575 seq.; *Revue des questions scientifiques*, Bruxelles, Octobre, 1882–1885. Motais, *Le déluge biblique devant la foi, l'écriture et la science*, Paris, 1885. For the literary feud between the two Reviews see *Revue*, 1886, 1, and *Controverse*, 1886, 2.

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Dubor, Clifford, Motais and others hold either that the Flood affected human life only in its centre, or that the negroes were exempt, or that some only, probably the descendants of Seth, were destroyed. Harlez is not unfavourably disposed to this opinion, and the Jesuits, Bellynck and Delsaux, consider it, to say the least, compatible with faith. A quarrel has broken out in France and Belgium on this very point. The Brussels *Revue* complains that the *Controverse* (which was once more liberal) has grown intolerant; the *Controverse*, fluttering with trepidation, appeals to the principles of faith. Here, as above also, the question is merely exegetical. No dogma—not even the dogmas of original sin and redemption—crosses the threshold. Again, therefore, it is allowable to follow a freer scientific exegesis. Though the survivors be exactly numbered, and the phrase *omnis homo* recur four times, still the familiar *modus loquendi* of Holy Scripture is equal to the task of reducing both facts to their proper proportions. The matter is more pregnant with difficulty, when the avowed end and aim of the Deluge is steadily kept in view, viz., an universal punishment which none should escape. Nevertheless the purpose may still be explained as moral, that is, to save the just from contamination, lest the knowledge of God should wholly perish. Hence the Sethites, not the vicious Chamites, were destroyed, because the better members of that stock were still to continue to be the depositaries of the knowledge of God.

Nor is this view at variance with the genealogical tables, or the confusion of speech. In both cases the question centres in Noe's descendants, in whose regard, it must be admitted, the God of the covenant exercised, from the beginning, a special providence. Rambouillet[13] has lately been vigorously belabouring the now defunct Motais, and he bids fair to continue the fight. He strenuously maintains that, according to Moses, the Cainites had long since gone forth from the land of Nod to settle in more distant

13 *Revue des sciences ecclésiastiques*, 1886, p. 319 seq. See *Zeitschrift für Kath. Theologie*, 1887, p. 23, seq.

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countries; that none but Sethites were destroyed; that only Noachians are enumerated in Moses' table of peoples; that there were none but Semites at Babel. But, even critical questions aside, these are caverns too darksome to be ever exposed to the full light of day. Nor do Acts XXVII., 26, and Romans V., 12, tell against his position. The Apostle is merely teaching that the human race is one in descent; the Deluge he does not even mention. The question becomes more complicated in dealing with passages in the New Testament that contain a special reference to the Flood. In Luke XVII., 27, Jesus compares the time of His second coming with the time of Noe. Noe's contemporaries tossed all warnings to the winds, and lived jauntily and heedlessly until the Flood came and destroyed all. The same expression occurs in the parallel verse 29, which narrates the destruction of all the people of Sodom, save Lot. In both cases the "*all*" (ἅπαντας) must, it seems, be construed literally. Nevertheless, in dealing with quotations or with historical dates, we should not lose sight of the well-known exegetical canon, which says that they should, if possible, be interpreted, according to the sense they bear in the original text. After all, the parallel passages just named only prove that all the people, on whom the Flood came, perished, except Noe's family. In I. Peter, III., 20, it is distinctly said that eight souls were saved by water; but they are only contrasted with the unbelievers around Noe. The same remark applies to II. Peter II., 5, and to Hebrews XI., 7. In II. Peter III., 6, it is said that the world "that then was, being overflowed with water, perished;" it does not, however, follow that heaven and earth were destroyed. In neither text nor context is there reference to the living world. Sophonias I., 2–4, as a biblical and prophetical phrase, is well worth noting. The Lord therein declares that he will gather together all things from off the face of the land: man and beast, birds of the air, and fishes of the sea, and that He will destroy men from off the face of the land. But, in spite of the apparent wholesale destruction, it is quite

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clear that the inhabitants of Judæa and Jerusalem were alone aimed at, and again those only who were "ungodly," and had fallen into idolatry.

On exegetical and dogmatic grounds, as it seems to me, this restriction of the Deluge is fully allowable. Not that I wish to declare myself absolutely in its favour. For the idea of an universal chastisement has undeniably penetrated into the very bones and marrow of Christianity. Nor do ethnography and anthropology imperatively demand its adoption. The exigencies of science can be met by dating the Flood one or two thousand years further back. Still it should be clearly understood that the other theory is consonant with the Faith. Faith is untouched by the limitation of the Flood as regards the earth and the animals; for as I have already pointed out, the earth teemed with animal life before Noe was created. The end God had in view was sufficiently compassed by the inundation of the part of the earth inhabited by man, and by the destruction, at the same time, of the animals known to man.

Although these biblical questions are on the borderland of revelation, it has been deemed expedient to discuss them in this volume, in order to give a more satisfactory finish to this part of the work. The great questions on revelation and biblical criticism are reserved for the second volume. These, when expounded, will form a bridge between the doctrines of creation and redemption.

END OF VOLUME I.

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